Common Commodities and Industries

The Clothing Trades Industry

B. W. Poole

THE CLOTHING TRADES INDUSTRY

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THE CLOTHING TRADES INDUSTRY

BY

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PREFACE

THIS is the first time in the history of the Clothing Trades that a popular description of its processes has been presented to the public ; it has been called for from many sources.

It is hoped that this handbook will be of some guidance to those parents seeking occupations for their boys and girls ; and also to the youths and maidens who are curious to know what kind of grapes grow on this thistle.

It is also hoped that accountants and others who require a cursory technical knowledge of many trades will find some assistance within these pages.

The systematic cutting presented herein is the Leeds Technical School Systems, and particularly adapted for teaching in Technical Schools, forming a sound basis for more advanced studies.

The Author would be pleased to receive suggestions for the Second Edition, or to give advice to those *bonâ-fide* seeking information.

He wishes to express his real appreciation to those firms who kindly loaned the printing blocks, and to his Deputy Chief Instructor, Mr. J. W. Hall, for kindly consenting to read through the proofs.

B. W. P.

LEEDS CENTRAL TECHNICAL SCHOOL,
LEEDS,
June, 1920.

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CHAPTER I

INTRODUCTION

THE term "Clothing Trades" is misleading in its etymology: it covers a very wide range of sectionalized occupations, but it certainly does not cover in its specialized meaning all the processes and occupations necessary to cover human nakedness.

The term "Clothing Trades" includes—

(1) Retail Bespoke Tailoring—
   (*a*) Sewing.
   (*b*) Cutting.
   (*c*) Administrative functions.

(2) Wholesale Clothing—
   (*a*) Making-up.
   (*b*) Cutting.
   (*c*) Administrative functions.
   (*d*) Marketing productions.

The Clothing Trades deal with all kinds of gentlemen's suits, sporting outfits, colonial outfits, military uniforms, liveries, all kinds of overcoats, raincoats into whose texture rubber does not enter, all kinds of ladies' costumes as distinct from dresses; and in the specialized firms, robes are made for Royalty, for State dress, judges,

etc. Some wholesale houses specialize in overalls. Garments are mostly made for the home market : there is very little export trade, but the *élite* of all civilized nations have been in the habit of obtaining their attire in the fashionable centres of West End tailoring.

This fact arises, not because really excellent tailoring is not carried on by other nations, but from the fact that Americans and Continentals can travel with the least irritating notice if dressed in West End clothes. The best in English tailoring is unobtrusively graceful, and so far has been the monopoly of West End houses with centuries of reputation and association with the *élite* of the world behind them.

The " Clothing Trades " are not considered to cover hat and cap manufacture, shirt or underwear, blouse or dressmaking, ties or hosiery, glove making, or boot and shoe manufacture, which although articles of clothing, have by custom come to be recognized as branches of manufacture distinct from that known by custom and common consent as the " Clothing Trades."

A better and more descriptive term is coming into general use, *i.e.*, " The Tailoring Trades " : Wholesale Clothing and Bespoke Tailoring now being separate sections under the one " Tailoring Trades Board."

Possibly there is no other trade (or group of trades, which it really is) that has met with so much adverse criticism as has been meted out to this necessary and important staple industry, immortalized by Carlyle and Kingsley.

Mankind expresses judgment upon the texture and the craftsmanship with the same freedom as it expresses opinions upon its food and drink. Taste, however, is an instinct, whereas judgment is the outcome of trained observation and experience.

It is the aim of the following pages to set up for the

man in the street guide-posts to lead his judgment along well-trodden pathways, fashioned by the unwearying toil of many thousands of his fellow beings.

Like food and drink, wearing apparel becomes part of the life of every man, even a savage, and the greater part of the life of every woman, and for that reason a lively interest is shown towards any description of the characteristics of mankind's outer covering.

Civilization marched with the evolution of clothes : history is written in the fashions of garments : Calthorp's *History of English Costume* is the history of English civilization.

Yet although the fabric of society is interwoven with the art of the tailor, anyone who followed this occupation for a livelihood since the days when the Craft Guilds were a power in the land, has either been looked upon with contempt or of a meaner order of human society. That state of things is rapidly passing into oblivion.

During the later years of the European War and since, the Tailoring Trades have been subjected to a good deal of public criticism.

In point of fact, the old-time and the new criticism is governed by the same factor, *i.e.*, that the tailor must work for lower rates and live on a meaner scale than, say, the miner, the engineer, or the doctor.

The miner hews rock but of himself creates nothing ; the engineer guides his lathe or actuates his levers to obtain machine results ; the doctor attempts to diagnose a body's ailment, but if he makes a " misfit " he changes the medicine.

The tailor creates fashions that mark epochs of history, that give zest to society, that form distractions to a prosy sermon, that too often is the one thing of paramount importance to men and women ; many people semi-starve themselves to dress well, for they are

affrighted by the nightmare that once they drift into shabbiness all other status too often vanishes.

Most people are interested in clothing. The following chapters will give them a keener interest, and incidentally an interest also in the producers of wearing apparel.

All the main features of technical operations are dealt with in a popular and in an interesting manner : technical terms are rigidly excluded wherever possible, but where the necessity arises for their introduction they are carefully explained.

It is hoped that this handbook will be of service to those anticipating entering the trade, and at the same time prevent others taking it up under a mistaken conception.

A very common error among those about to take up any calling is to expect it to be the picture of their own imagination : they should, before deciding, find out all they can, either from individuals or from books.

A popular knowledge of the operations of a trade should be accessible, and should be carefully considered before taking it up ; much disappointment and disenchantment would be avoided : round pegs would not then be found in square holes.

Under the Trade Boards Acts, 1909 and 1913, there has existed a Tailoring Trades Board dominated by wholesale clothiers. Mainly owing to the untiring efforts of F. A. Stacey, Esq., M.J.I., and Hon. Sec. to the United Kingdom Association of Master and Foremen Cutters, a separate section of the Board has been allocated to the retail trades. Minimum wages have been decided upon for the wholesale, and the minimum for the retail is now under negotiation.

CHAPTER II

CUTTING OPERATIONS AND GRADES IN THE BESPOKE TRADE

ALL operations in the clothing trades fall naturally and by custom into two well-defined groups, which although interdependent, yet are complete in themselves, each forming a branch of craft requiring specialized skill in varying degrees.

Cutting is the first and primary group, and as a very hazy conception pervades the public mind as to who really are cutters, and as to what are the functions of cutters, it seems necessary to clear the ground as we go.

Practical cutting has divided itself into two tributary channels, each determined by the particular demands of the branch of the Clothing Trades it feeds : each of these tributary groups has a distinctive objective as will become apparent to the reader.

In this chapter it is hoped that clear distinctions will be given between cutters and cutting operations for all phases of trade under the heading of " Bespoke."

The term " Bespoke " is unhappy in its application ; it means, " to be ordered beforehand," yet thousands of orders made by wholesale clothiers, as will be seen, are " ordered beforehand."

Bespoke is a term that has come down to us from Anglo-Saxon days when people were in the habit of bespeaking the labour or products of labour, in exchange for their own labour or products ; but under modern commercial conditions, the term is not so directly applicable, nor is it sufficiently distinctive.

It will be seen that even in bespoke orders, as well

as in methods, it is an impossibility to draw an exact line between the wholesale and the bespoke, and yet, as was prefaced, the objectives and the *modus operandi* differ considerably.

The true distinction between the two branches has been aptly defined by the Ministry of Labour in setting out its syllabus for training disabled soldiers and sailors, and it defines the bespoke as " Retail bespoke individual tailoring which entails the *minimum* of machine work in the garments."

That is a fairly accurate description, for the wholesale has a penchant for the *maximum* amount of machine work that it is possible to attach to the production of clothing.

Bespoke tailoring covers a group of operations adapting processes of manufacture peculiar to itself ; it deals directly with the consumer without the intervention of a middleman ; it manufactures expressly for the individual and gives skilled personal service to such an individual's requirements, which may, and often do, differ from the requirements of any other.

It follows that the processes must be individualized, must be under the personal control of him who undertakes to satisfy individual requirements ; hence such processes are more highly skilled, take up more time, and are more tedious, and so more costly. It is just such a difference as exists between a skilfully executed portrait which shows the subject to its best advantage, and the bulk production of a thousand photographs all off the one plate.

Comparatively few makers-up, *i.e.*, tailors and tailoresses, know anything about cutting, or even felt the need of knowing ; of that few many have but a cursory theoretical knowledge.

With very few exceptions, cutters as a rule in both

bespoke and wholesale grow up in, and with the trade ; that is to say they are the product of years of sub-conscious assimilation of trade environment. The ability to cut well and to retain a position as a cutter is evidence of natural initiative and aptitude ; every tailor who ever put a stitch in a garment has had, and has to-day, the opportunity of raising himself to the rank of cutter if he but make the effort.

Cutting is a term, like almost every other term in the clothing trades, peculiarly misleading ; attempts have been made to modernize the term in keeping with the functions, but old customs and ancient nomenclature die hard.

The phases of cutting hereafter set forth are applicable to widely different classes of trade, all plodding the even tenor of the way to riches and a fortune to be left behind.

(*a*) **Cutting** for high-class retail trades, in which the cutter holds the " key " position—with him the firm's *clientèle* prefer to deal—they wish to see the cutter. He is the man upon whom hinges the success and reputation of the firm.

He is described in ancient parlance as the " foreman tailor," hence the oldest society of cutters in the world is named the " National Federation of Foremen Tailors," whose ranks have been graced by men who have been respected by princes.

He does not sew : it would be considered an insult to ask him to sew, yet he is a particularly good judge of sewing and its possibilities, having won his way upwards by talent and skill. He directs and controls the methods and procedure of making-up ; he engages or dismisses the workmen employed by his firm, for ney are under his authority and his word is final.

He has nothing to do with window shows, such firms as he is employed by gain their custom by reputation ;

nothing but a wire blind or oak windowpiece advertises the fact that his firm exists. He has nothing to do with stock-keeping, or folding cloths. He does not serve, but customers almost invariably have the assistance of his judgment when being shown materials by the shopman. He is frequently consulted by the buyer of cloths, though in most cases he buys all the trimmings required.

A qualified cutter is a better judge of the tailoring qualities of materials than any other person, not excepting the makers of the cloths.

He produces the patterns from which the garments are cut, usually by his assistant ; he fits on the garments and corrects them, also making the corrections in the customers' patterns which are named and retained for each. He prefers to, and usually measures all the customers he cuts for.

His firm makes and sends garments to their *clientèle* in whatever part of the globe they may happen to be.

Such a cutter is a man of versatile ability, keen and accurate judgment, cultivated taste and dexterity.

His position is the acme of the cutting profession, and his salary is from £8 8s. to £14 14s., according to the status of the firm he is employed by.

A **Trimmer** is a young man aspiring to a cutter's position. He waits upon the cutter before mentioned ; frequently cuts out the materials after the cutter has marked in the garments ; sometimes he cuts trousers as directed by the cutter ; he cuts all the trimmings required in any job, writes the work tickets and ties the job up ready for the maker. He gets the customer's patterns from the peg and returns them when done with.

In firms with a large *clientèle* there are the head cutter, first and second coat cutters, trouser cutter, and trimmer or trimmers. In this class of firm clients usually walk in

and ask for the cutter who is in the habit of attending to them. Such a cutter would cut year after year for his special customers, and so would acquire a mass of detail experience applicable to the wants and wishes of each individual for whom he has cut.

Minimum salary as laid down by the Cutters' Union : cutters £6 6s., and assistants £4 4s.

An experienced cutter is not manufactured in a school : he is not the product of a moment, but the evolution of years, built upon innate talent and judgment.

In the class of trades just outlined, the very highest type of garments both for ladies and gentlemen are produced.

They are works of artistic skill and cannot be produced *en bloc*. There is as much difference between the work here indicated, and a low-grade tailor, as there is between the daub of a schoolgirl and an Academy artist. Clients with aesthetic taste are able to appraise the distinction, though they cannot define it.

(*b*) Second-grade high-class shops where the cutter takes up a similar position as in (*a*). The duties, work, and results follow on somewhat similar lines, but the garments are merchanted at lower prices. Frequently the Tailor's Union allow such firms a little concession in the trade rate for making.

(*c*) Country trades—these vary very considerably, and where there is a wealthy residential population, a public school, or a fashionable hunt, very high quality work is produced.

This is also applicable to fashionable spas and seaside resorts.

With such firms a cutter has a similar position as set out under (*a*) or (*b*).

There is also another class of country trade which caters for market and similar towns. A cutter in such

trades is frequently salesman and general shopman. He sometimes has to fill up time sewing. This class of cutter is not expected to show so high a degree of ability as those mentioned before ; if he possesses a set of block patterns and knows how to use them he can generally manage.

At the same time it must be admitted that this class of trade has evolved some of the foremost cutters. If a man possesses natural intelligence, this trade is but the stepping-stone to higher positions. As the taste and appreciation of the customers are generally unattuned, a high standard of skill is not looked for. It forms one of the very best training grounds for the cutter who aspires to excel.

The trade is never hustled—there's always the morrow, and so difficult problems of garment fitting can be studiously thought out.

From this class of trade has been recruited very many of the finest skilled sewing tailors in the Metropolis. Generally speaking, this is the only class of trade that takes apprentices, and it is doubtful if in the whole of England at the present time there can be found a hundred tailor apprentices.

Owing to the fact that plenty of strong thick hand sewing is demanded, and there is plenty of time to do such, a tailor receives such a training in thoroughness, patience, and respect for his work that never deserts him, and forms just the foundation upon which to superimpose the higher degrees of skill aspired to by West End tailors.

A lad who serves his apprenticeship in a quick-moving town-trade never acquires the quiet painstaking skill that his country cousin does. The best type of tailor grew up in country trades. Salary of cutter, £3 to £4 (pre-war).

(*d*) Up and down the kingdom are to be seen numerous tailors' shops under various designations : " Practical Tailor," " Merchant Tailor," " High-class Tailor," etc., etc.

These designations are misleading, and, like charity, cover a multitude of sins.

Many of them are owned by cutters who have commenced business for themselves ; these are *bonâ-fide* practitioners from whom the public often obtain really excellent garments.

If the prices paid permit the proprietor to pay and employ skilled workmen, there is no reason why the goods from these shops should not give every satisfaction.

The owner being himself a cutter usually employs none, but sometimes a trimmer.

There are also trades carried on under these names which should more honestly be called " Commercial Tailors."

In such trades, and their number is legion, the owner is not a practical man, and it is a singular fact and true, that the less he knows about the trade, the quicker he gets rich.

He is a man probably with some capital who bought a going concern, and retained the practical staff until he got the hang of things.

Here the conditions vary hugely and are governed solely by the commercial factor. Such trades are no fit training ground either for cutters or for tailors.

It is not suggested that such trades are gulling the public with their cheap trousers and cheaper suits ; of course, there are dodges in it, and it requires smartness, but for what the public pays it gets as good a value as it can rightly expect, and oftentimes better than it deserves. A £3 3s. suit from a cheap shop is as good as a £6 6s. from a better—that is in proportion, and

nowhere on this planet is it the practice to hand over £6 6s. for £3 3s.

Hence it follows that these shops adopt a commercial method of turning out garments rapidly.

The cutter has to handle many duties ; his artistic soul (if he had one) atrophies ; he has no time to do things well ; beautiful work is not his forte ; his business is to get the garments outside his employer's shop and the money into his cash register. He must become an adept in the fine art of convincing customers against their better judgment, of convincing them that the garments produced are all that they could want, or should want. Shopman and cutter often overlap.

This is not an exaggeration—it exists.

In some of these shops the so-called cutter never sees a customer : they are measured by a shopman, and the measures sent to the cutting-room. The cutter makes the changes he imagines to be necessary from his block patterns, chalks the garments in, and hands them over to a girl or youth to chop-out.

This cutter's daily life is the facsimile of a factory measure cutter, one endless round of mechanical changes, which may happen to pass muster for the real goods. Sometimes a customer will persist in being fitted on, which is superintended by the shopman, who knows as much about it as a cat does about a dairy.

Again, this is not an exaggeration—it exists. It is almost useless fighting against the inevitable—the public taste is uneducated—it demands such productions, and there are always commercial men ready to oblige it, and satiate it so much with low-grade goods, that in time it comes to think there can be none other—this is a true fact.

There are also under this heading, firms which exhibit materials in artistically dressed shop windows, who

never cut or make a single garment themselves or by their employees.

The measures of the customers are taken, and together with the materials are sent to a wholesale clothing factory, which caters for a "cut, trim, and make" trade.

These so-called bespoke tailors do not keep a cutter or a tailor : they sometimes keep a woman to do minor alterations, or send such out to a jobbing tailor. Yet the frontage they exhibit with its brass and coppered fittings attracts the public like treacle does the bee.

(*e*) Again, there is the **Multiple** shop, not exactly multiplied in the same town, but in many other towns. Such firms themselves are now multipled up and down the country ; twenty years ago such were hardly known. They are the creation of capitalists, more or less of the same type as patent medicine vendors—they vend their own medicines.

Their shop-windows are really works of art—the dressing of which is an entirely separate business to tailoring.

The model garments displayed are never meant for wear—in fact the models are either all front or all back —they are built upon the freehand perspective principle. The tailors who make the garments for the windows are experts in outside finish—they do nothing else—there are no insides to the coat—no guts, as it is termed in the trade. The garment is simply an outside shell, and the models are stuffed and padded until the garment assumes bold and creaseless form. An acquaintance of the writer's often spent as much time as a whole day stuffing one coat model for display. Yes, window dressing is a fine art in perspective : one often imagines one sees what one does not.

These splendidly fitted shops are two-phase ; one

phase is that in which the beautiful town shops are but the front-shows of a factory.

Many of these shops are actually owned by factories, others again own the factories, that is to say, all the work from all the shops go to their own factories for cut, make, and trim.

In the case where the factory owns the shops, the procedure is the same. In both cases there is the wholesale profit on the factory and the retail on the shops.

All that glitters is not gold. Someone said "Reiteration is the soul of conviction."

The other phase of multiple shop is that in which each branch is answerable for its own trade, and so it employs a measure-cutter of the factory standard, a mechanical operator, who has a set of block patterns which he had adapted to facilitate rapid output, for the poor chap has to slog like a navvy, and is expected to chop out as many as forty suits a day. What attention can he give to individual orders? He has no time to think of himself: thinking is not his bill, a thinking apparatus would be in the way: his business is to get a hustle on.

It is not every cutter that cares to handle this class of trade; it is not everyone who could do so.

The making-up is contracted-out for locally, with small factory masters, or as they are mis-termed, master tailors, who are the middlemen between the employer and the workers who do his work.

The trade attracted by these shops is termed "passing," here to-day and gone to-morrow; hundreds of thousands often pass these shop windows, it matters little whether customers come again, there are plenty more coming along.

In the provinces, the rent alone of such show-shops is £800 to £1,000 per annum (pre-war.)

(*f*) Lastly, there is the phase of bespoke tailoring in every little greengrocer's who does the club business ; every hatter now professes to make clothing to measure, but it is all camouflaged factory work, and the business goes to X, Y & Co.

No local cutter or workmen are required.

All the foregoing phases of the trade are included under the term " bespoke."

Yes, reader ; probably you have arrived at the same conviction : what a delightfully expansive language is the English ?

CHAPTER III

CUTTING OPERATIONS AND GRADES IN THE WHOLESALE TRADE

Two objectives of wholesale cutting stand out above all others, viz., (1) to get the garments out of the smallest quantity of materials, and (2) to get as many garments cut in one operation as human energy assisted by elaborate machinery will permit.

When tens of thousands of garments are cut every day, it must be self-evident that even the neglect of half an inch of material per garment will in the course of a year's trading affect the Profit and Loss Account.

Cutting for the wholesale is sectionalized on the lines indicated here—in some firms more sectionalized still.

The object of sectionalization is to enable boys, girls, or lesser skilled males to be employed upon the more mechanical processes.

Lay-getting. A quarter of a century ago lay-getting was the first qualification of a stock-cutter.

Lay-getting is the knowledge of interlocking the various pieces comprising the paper patterns of a garment or suit to be cut, so that the pieces fit into one another, leaving the minimum of waste.

The old-time stock-cutter had these lays stored away in his memory: certain sizes of suits cut together interlock in a special manner, again reducing waste; this necessitates a special lay.

As the widths of materials vary greatly, *i.e.*, double width, 52-inch to 60-inch goods, and single width, 26½-inch to 30-inch, lays must also vary.

Added to this, the fact that various sizes of suits or

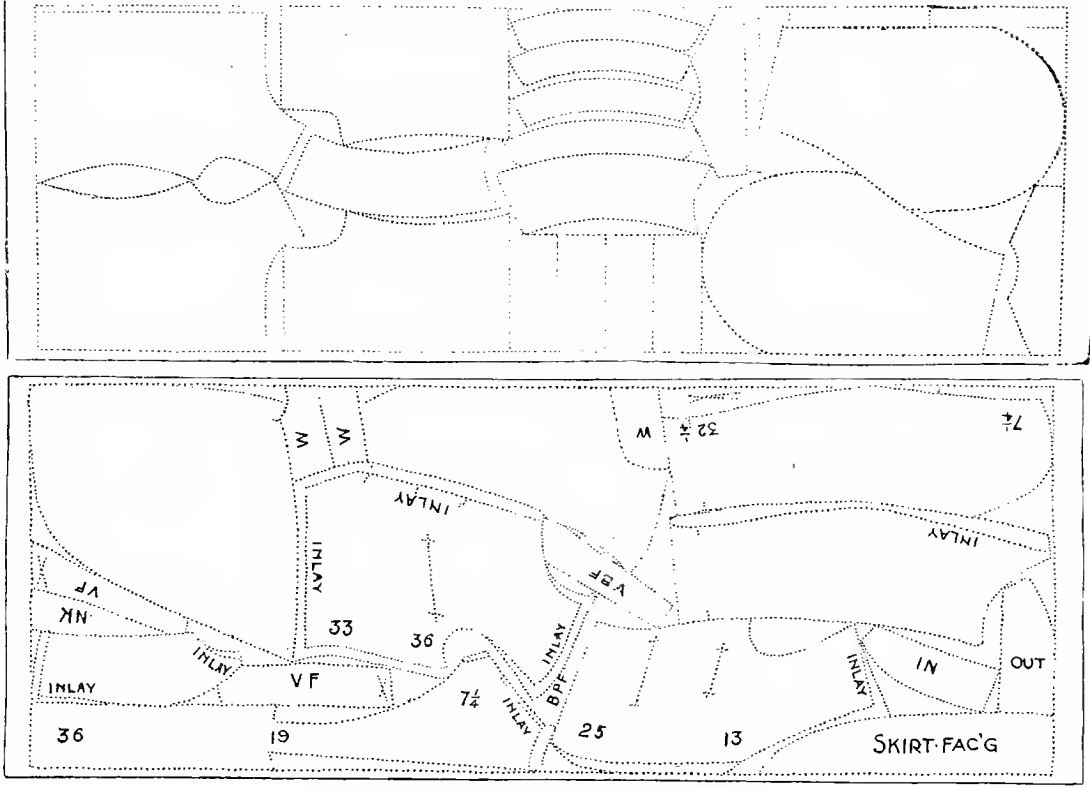


DIAGRAM 1 PERFORATED LAYS

garments take different quantities of materials, lays must again vary to agree with sizes or combinations of sizes.

From this it will be readily understood that *economical lays* form a very important factor in cutting for the wholesale, making possible a saving of millions of inches, quite impossible in the retail bespoke where garments are not cut *en bloc*, but for individuals.

Again it is obvious, that in cutting huge quantities of suits the greater number will be cut for the average sizes, and less for the out-sizes.

A typical cutting scale for 300 suits is as follows—

21	42	87	87	42	21	quantities per size ;
2	3	4	5	6	7	sizes.

Economical Lay-getting is a very important phase of stock-cutting ; stock-cutting being the term applied to cutting stock sizes.

Although stock-cutters in the very small factories have to get their own lays and chalk them in, the whole business of stock-cutting has been revolutionized during the last twenty years by the method known as " The Marsden Process Marker."

This patent process is one of those simple ones, that causes people to wonder why they did not themselves think of it.

It consists in working all the lays and combinations of lays before referred to, upon specially tough paper or linen—worked out, too, and chalked in upon the varying widths of paper to agree with all known widths of cloths, so that the waste is irreducible (*vide* Diag. 1).

The paper lays are then perforated by a special machine with a fine punch in place of a sewing needle (*vide* Diag. 2).

After the lays have been once defined, which may be

DIAGRAM 2
PERFORATING MACHINE

done by a firm's foreman cutter, all the operations of cutting are purely mechanical.

The Marsden process ensures that each cutter (and there may be 100 in a big cutting-room), however unskilled, turns out exactly the same work as the most expert man on the staff.

Since the saving and the planning is already in the perforated lays, the unskilled workman is enabled to turn out a greatly increased amount of work to a set standard. This process cuts the old-time work of the cutting-room in two, and ensures the employment of lower grades of skilled workers. It has saved thousands of pounds in labour and materials. All firms of any pretensions have adopted this process.

Marking-in. Patterns used to be chalked around each piece singly, with a specially prepared chalk made in thin cakes, known as pipeclay; this is still the method in the bespoke.

With the advent of the process-marker this method was superseded. The marker-in obtains the necessary perforated lay from the fixtures, and lays it upon the material to be cut; then with a rubber he rubs a specially prepared powdered chalk through the perforation, which powder has the property of sticking to the stuff.

On removing the perforated lay, the suit, suits, or garments to be cut, are indicated upon the material by outlines composed of very fine dots running in juxtaposition. The material is then ready for

Laying-up. This is sometimes done by hand, but the modern method is to use a laying-up machine (*vide* Diag. 3).

The machine is fitted with a set of edge guides, which ensure the material being laid up to an even cutting edge. All overlapping of edges, waste of goods, and

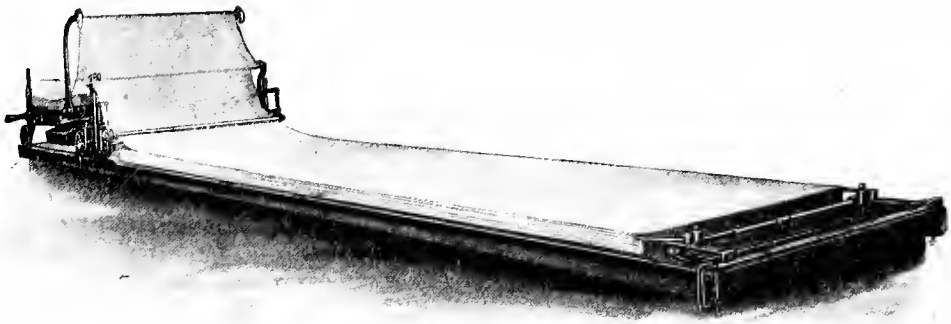


DIAGRAM 3

wrinkled layers are done away with: each layer is counted automatically: laying-up by hand cannot compare in any sense with laying-up machines; the tensions are uneven in hand-laying.

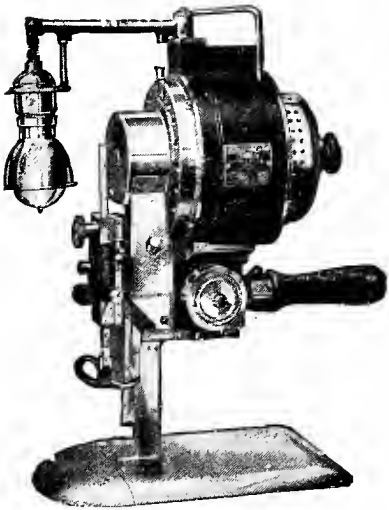


Diagram 4

The number of lays is determined by the quantity to be cut (*ante.*). If three layers of a size were wanted, such would be cut with shears by hand, shears costing £4 4s. a pair.

If ten layers were required, they would most likely be cut by a "Reciprocating Eastman Electric Portable Knife Cutter" (*vide* Diag. 4). The makers claim the machine will cut any number of thicknesses that the band-knife will cut.

As usual, it is an American invention.

If twenty-five layers are wanted, then the layer-up will clamp that number together and pass the lot over to the

Band Knife (*vide* Diag. 5). This is the "Beecroft" high-speed cloth-cutting band-knife having an endless band knife of 19 feet: it can be run at the exceptionally high knife velocity of 7,000 feet per minute, without vibration or any fear of breakage. It is the best type of this machine on the market, and is British made.

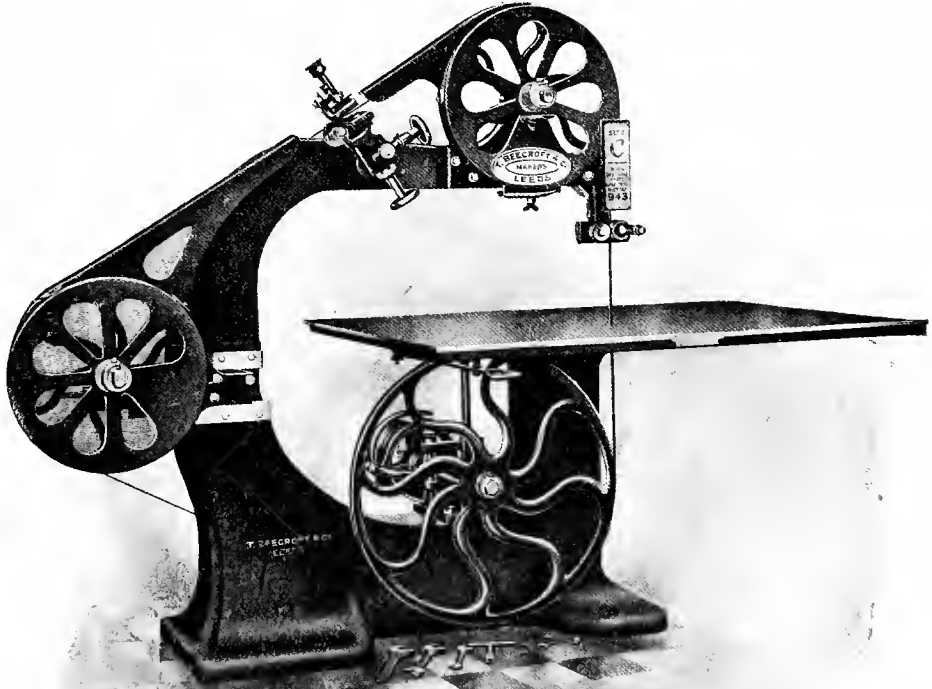
It is questionable whether the United Garment Workers' Union will now agree to any greater number than 25-thick-lay being put under the knife : it adds to the danger, and it is doubtful if anything is gained. In years gone by the writer has seen a 40-thick-lay being manoeuvred under a band-knife, and it required three men to handle it. All the lays here referred to are double-width goods, so that in a 25-thick-lay there are 50 thicknesses of cloth. It is not a bad operation to cut out twenty-five suits simultaneously as clean as slicing a melon.

Trimming. While the foregoing processes are in operation, the trimmings are being marked in by perforated lays, laid up and cut under a band-knife suitable for trimmings, or in the case of small quantities or few layers, by a *slot-knife*. This is a long knife somewhat like a butcher's, used up and down in a parallel slot cut in the centre of the operator's work-table.

Tying-up. The cloth parts of the cutting, and the cut-out trimmings, are then sorted out and placed in bundles according to their sizes, and whether coats, vests, or trousers. The size and work tickets having already been prepared by the ticket girl, they are inserted in the correct bundles, tied up with a distinguishing slip under the string, and passed to the

Fitting-up. In cutting out all the patterns are marked in correctly so as to produce when made up certain sizes of garments ; the seams which the machinists are in the habit of taking are included in the patterns when cut by the *pattern cutter*.

The linings and other trimmings and also the cloth facings are but sections of the patterns from which the outsides were cut. Fitting-up is a checking or adjusting operation ; the insides for each size of garment being carefully adjusted so as to leave barely enough for the


T. BEECROFT & CO.
LEEDS

machinist to absorb ; that is, the insides are adjusted to the outsides, so that in making, one can be placed upon the other and bagged round. The fitter-up cuts all the pocket mouths, and if the material has a pronounced design, he also matches the pattern to agree with the part of the garment to which the matched part has to be sewn. He usually marks and adjusts one of a size, laying it on top of the others, and trims the surplus edges off with a slot-knife.

He may tie all the bundles up again as they came to him ; or if the firm operates a subdivisional method, he may sort out into section bundles, taking care to see that each lot carries its identification tickets.

All the cutting operations aforementioned and any other cutting operation is performed with patterns prepared by the

Pattern Cutter. This is a position of some importance in a factory, for he has charge of all the firm's patterns which are their stock-in-trade, he replaces worn ones, and prepares new ones for any prevailing or current fashion ; from these patterns are prepared the perforated lays dealt with previously.

The status of the position is not nearly so important as the cutter's referred to in section (*a*), Chapter II, for a pattern cutter does not come into contact with the individuals his patterns should fit. The patterns are not required to individualize, but to strike the best average for any size.

Neither is he thrown upon his own resources, for the patterns of a wholesale clothier are his most valuable asset ; it would be simpler to rebuild his factory than to start again from nothing and rebuild his ranges of patterns.

The pattern-cutter has the quintessence of a quarter or half a century embodied in the firm's patterns, from

which it is merely transition to evolve additions or deductions for changing styles, or minor adjustments for improvements.

Wholesale firms seize every opportunity of seeing resultant garments from their patterns upon living models, so as to adjust minor average details, and do not hesitate in paying the costs of experimenting on new ideas or styles.

Some firms prefer that a *pattern cutter* shall have been a practical sewing tailor with cutting experience in the bespoke, with usually the added experience of having been somewhile in a wholesale cutting-room.

Others again are satisfied to take a man who has been cutting stock and measures all his working life, and who has learnt to draught patterns.

Yet other firms prefer to get in fresh blood, recognizing the fact that to a really qualified bespoke cutter who has been also a practical tailor, all the operations in a wholesale cutting-room are to him but as the change of a shuttle.

Factory Measure Cutting, known by the paradox of "Wholesale Bespoke." As described in the previous chapter, there are factories which run bespoke shops under some other name, sometimes the name of the manager ; there are other factories which depend entirely upon the demands from their bespoke shops—they make no trade for other retailers ; there are numerous bespoke shops which guarantee to make garments "to measure": there are hatters, hosiers, and every village "Whiteley" who take such orders for factories ; there are numerous packmen or Scotch drapers who do likewise ; and there are the new type of clothing supply clubs.

Orders from these sources, which run into hundreds of thousands weekly, form the staple trade of the section mis-named the "wholesale bespoke." Large factories

exist which do nothing else but cut, trim, and make the material to measures sent them from bespoke shops.

This very peculiar section of the trade gives rise to what is termed **Factory Measure Cutting,** in the operation of which the better skilled stock-cutters, who have learned to alter the firm's patterns to accord with the measures sent them from bespoke shops, are occupied.

Some firms rub in a Marsden Patent Process Lay, and have the changes made on that ; other firms who do a big trade in this kind of order, sort all sizes up, as near to one another as to half an inch, rub in stock lays, and cut them dozens at a time under the band-knife.

This is but another mechanical operation as to which little minor responsibility rests with the factory ; it is the " bespoke " man who undertakes the responsibility, and who is answerable both to his customer and to the factory. There was a letter recently in *Men's Wear* complaining of the serious want of attention in the factories relating to wholesale bespoke orders—what else can be expected ? Oft-times the man who takes the orders knows considerably less about it than the measure cutter who is working in the dark.

This class of trade is frequently sent for try-on at a small additional charge—if the fitter-on knew anything about the trade, if he knew the rudiments of tailoring, he would not deceive himself with " wholesale bespoke."

The first wholesale house in Leeds, and one of the highest in reputation for quality goods in the kingdom, has given up " wholesale " bespoke altogether.

They now practice the trade *à la* American : it is agreed generally, except by those who are purblind, that there are no flies on Uncle Sam. It would probably be edifying to hear his definition of " wholesale bespoke ": it is questionable whether it could be Yankeeized. He

will tell you that the average American suit from the "peg" is better fitting and more generally satisfactory than any quasi-wholesale bespoke.

The firm just referred to have adopted the American idea of making all sorts of stock sizes, in all sorts of materials, from a £4 4s. to a £14 14s. suit, and they do it well. Anyone who buys their suits off the peg can get a suit to fit as well as though it were made for him, and very often better than if it were "bespoked."

This is arrived at by making average size suits, and many others with variations which are outside the average.

There is one big advantage in this; a customer can walk into a store in New York City and walk out with a suit which not only fits his odd-size figure, but of a material which suits his make-up and pleases him: how often have you chosen suitings from patterns or from pieces which you disliked when finished?

This is the whole secret of the ready-to-wear ladies' garment trade. A lady is frequently better dressed in a ready-made costume than she is in one made for her. And the reason is this: she walks into a store and fits on all she fancies, till she obtains just the style that suits her figure, and just the colour scheme that goes with her complexion—she is then well-tailored in spite of being ready-made-tailored. This principle is that upon which the Parisian costumier has built his reputation.

CHAPTER IV

SYSTEMATIC CUTTING

ALL the patterns used in the cutting-room operations in the wholesale were produced originally by the pattern cutter on some similar method to that given in this chapter : all the patterns used in the bespoke trade are so produced.

Pattern cutters, either for the wholesale or for the bespoke are usually recruited from the ranks of sewing-tailors, and in some cases from among those who have become familiar with the operations of the trade by long years of association.

It is therefore somewhat risky for others who know nothing of making-up, to take upon themselves the strenuous duties of cutting and fitting. Yet in some isolated cases non-practical men have been known to succeed, of course by virtue of their natural aptitude, energy, talents, and the favours of good fortune.

This phase of cutting takes rank among the first of sciences ; but unlike geometry, it is a liberal science with few natural phenomena reduced to natural laws. Darwin in his researches met with a whole host of variations in the application of clear natural laws. The science of cutting is based upon the products of Nature, just in the same way as all the investigations of Darwin were so based, and in like manner the cutter comes face to face with the many whims of nature upsetting by unexpected variations, many valuable theories demonstrated conclusively by the predominating evidence of nature's phenomena. Nature's basis for the cutter, *i.e.*, the human figure, developes according to well-known

natural laws—nothing is more certain—but Nature, always a fickle and merciless mistress, having once settled the main lines of creation, comes to the conclusion that she detests monotony, and so proceeds to introduce so many variations that no two leaves shall be exactly alike, no two thumb prints shall be the same, and that the conformation of one body and its mind shall differ from all others, hence the difficulties that confront a cutter who is expected to produce good fitting garments from imperfect, and oft-times inaccurate measurements, are apparent to the dullest. (In point of fact all measures of the human figure are merely approximations.) Hence, it follows that the application of science to any subject endued by Nature with life, must necessarily be of a liberal character.

There is one feature about this phase of cutting which differentiates it from all other trade operations, and that is, that it never can become a mechanical operation : it is closely allied to the profession of doctoring.

The average shop-keeper may serve one for years without ever coming into individual contact with one's person : how different with the physician and the fitter : they have direct access to one's person ; they deal with you, not yours.

The same model is common to them both, *corpus humanum*, nature's masterpiece, like which the world can show nothing.

Just as the man of healing is assisted to success by a knowledge of your constitution, so the man of modes by a knowledge of your individual figure formation. It is this close and constant contact with so marvellous a fabric as the human body which really lifts cutting from a craft to an art, and the true cutter from the level of a mechanic to a place among professional men ; or to speak truly, it is that which ought to lift him, for in

England, sorely afflicted with effete and ancient conventionalisms, he has never had his due.

Think for a moment whether you are required to fit an inanimate brick wall, or a being of life, motion, taste, and feeling.

Between the doctor and the cutter there is no distinction save of degree ; one sees to the interior, and the other to the exterior : health and adornment are close friends.

It follows, therefore, that a qualified cutter must have something of the artist about him : he must have a resourcefulness in himself. He does not work with exact instruments and rigid tools : his business is not to turn a crank, wind a handle, or press a button : his appliances are brains and a square.

It is just this free liberal artistic element which raises true cutting above the operations of an exact science, and to which the public in all ages have unconsciously paid homage.

Three methods of systematic cutting are practised—

(*a*) Breast measure cutting ;
(*b*) Direct measure cutting ;
(*c*) Shoulder measure cutting.

The writer is not a votary of the shoulder measure method for the reason that its application is unscientific, unnatural, and illogical. It is based upon a measure taken from A^1, over the shoulder end at D^1, down the front of armhole and under the armpit at E, back to A^1, on the figure (see Fig. 4).

The science of systematic cutting owes more to Dr. Henry Wampen than to any other man, living or dead. It is true that before his time there were practical man seeking after truth, and many incoherent attempts to formulate scientific systems, but since his time the science has made such rapid strides that to-day

we probably know all the data that can be known. But it owes it to Wampen, because his was the first scientific mind brought to bear on the subject ; he was the first who laid down scientific formulae ; and he was not a tailor, but a professor of mathematics.

As an art student, he was naturally conversant with the eight-heads' theory of figure measurement and proportionate development, the earliest trace of which dates back to Egyptian civilization.

He surrendered his professorship, and in 1834 published *Mathematical Proportions of the Human Body.* Later he came to London and published *Anatomy for Tailors*, and also *Anthropometry for Tailors.* He demonstrated that in the normal figure where the height was in proportion to the breast, all calculations necessary could be based upon the breast measure, for the reason that the breast measure was naturally inherent in the eight-heads' theory, the width dimensions being equal to the height quantities. But for abnormal figures, height or depth quantities were to be obtained from a scale based on the height of figure, while its width quantities were based upon the breast circumference. This is scientifically true and incontrovertible.

But Wampen's methods were in advance of the time, they were too obtuse and mathematical for practical men of his day, and few beyond the small circle of his own pupils ever mastered his systems.

He could not, with the training he had had, differentiate between the exactness of geometry and Nature's liberal science of form-growth, influenced not only by rules or laws of proportion, but also by circumstances, heredity and environment.

The writer practises and teaches together with his assistants both the methods (*a*) and (*b*) ; both methods are essential in the training of a cutter. The proper

study of mankind is man : it is vitally necessary to the systematic cutter. In the hands of a trained observer of figure formations, the proportionate breast measure method is all that is necessary, for he simply adds to or takes from his proportionate pattern so that it shall agree with any variations observed in the figure. In point of fact some cutters in the early days made a world-wide reputation and used nothing but a simple breast measure system applied with a liberal use of brains and judgment.

It must be evident that among the millions of humans, there must be some agreement between their proportions, and the standard figure proportions, accepted by trained intellects since the days of the Egyptians, and perhaps before. In point of fact there is a great deal of agreement ; if it were not so, the gigantic wholesale clothing industry would have been foredoomed to failure.

The **Breast Measure System** here presented is based upon this agreement of proportionate development, to which the growth of human bodies mysteriously holds allegiance, and is absolutely reliable for all normal growths, or even for the many numerous figures which but fractionally depart from the standard.

Agreements make classes : the breast measure method designs coats and vests for all figures that proportionately fall into classes, *e.g.*, all figures of 36 inches breast circumference should develop sectionally in agreement with the standard ; actually the majority do, or, to be exact, very closely to the standard of growth arrived at by men of experience and research.

It must be also evident that many figures differ from the accepted standard : these are what are termed " abnormal " figures, that is abnormal to the artistic standard, but not necessarily deformed or unsightly.

These are different to the proportionate standard,

and differences make individuals. The **Direct Measure System** designs for individuals. While a keenly observant and qualified cutter can appraise variations and adapt his proportionate patterns to agree, it is a shorter method and one of distinctly educational value to take sectional measure direct on the figure, hence the term, " direct measures."

It is not advantageous to teach Direct Measures before the proportionate system, because in very many cases the Breast Measure answers equally as well, and because it requires considerable practice in measuring human figures, before the necessary skill is acquired to take them with any degree of accuracy. Many cutters take their measures in a slovenly manner, but their years of experience have grafted in their minds subconscious standards to which their minds are for ever referring while they measure, and so to a large extent set-off or amplify discrepancies.

It is first necessary to master the Breast Measure System, and to become familiar with the quantities which the proportionate draught allocates to various sections, and for all changes in the breast measure circumferences.

When this knowledge is acquired and stored in the mind, the mind will subconsciously check any direct measures which may be taken, and swiftly in the act of measuring, compare them with the proportionate. In such a way accurate knowledge of figure variations and the quantities required will be built up.

It cannot be too strongly emphasized that the results of any system depend upon accurate measures : nor can it be too clearly pointed out that a far higher technique is demanded in measuring the human figure which is a palpitating mass of living fibres, and whose thorax moves in and out like a bellows seventeen times per

minute, than is necessary to measure a window sash for a pane of glass.

In the proportionate system the most important measure to take is the breast circumference. The tape measure must be placed round the chest, close up under the arms, and across the back, taking care it does not drop below the bottom ends of the blade bones—it should cross the bottom ends of these bones—bring it round the chest, neither tight nor loose—just fair.

This system gives a well-balanced and proportionate coat, clean to the figure. If an easier coat is demanded, do not attempt to alter the proportions, but simply cut to a larger working scale. The system includes within itself provision for all necessary quarter-inch seams as is the custom in the bespoke trade. In the wholesale trade, where the machinists take about half-inch seams, it will be necessary to call a 36-breast pattern a nominal 34-breast, for that is the size it will work out to after going through the machine-room.

A sample set of measures taken on the body, *i.e.*, all measures here (except the chest and waist, which are taken on the vest) are taken on the coat—

Length of coat : 31 inches.
Half-width of back : $7\frac{1}{2}$ inches.
Continue this on to elbow : 20 inches.
Again continue to cuff : $31\frac{1}{2}$ inches.
Breast measure on vest : 39 inches.
Waist measure on vest : 35 inches.
The Diagram 1 is set out to these measures.

Normal Lounge Coat, Diag. 1

Instructions for Draughting

A is the position of the collar seam at back neck ; it is usually the position of the collar stud ; anatomically

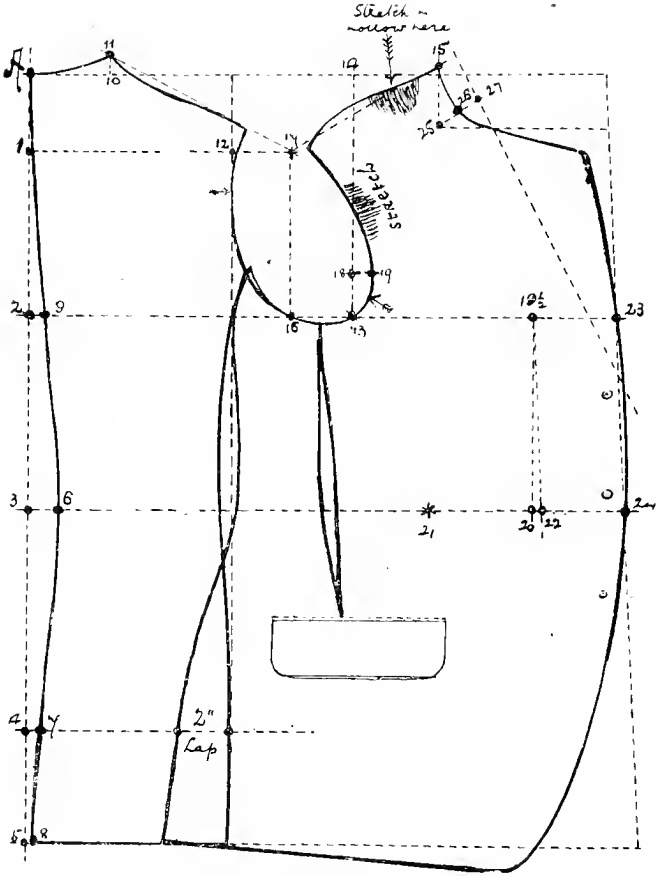


DIAGRAM 1

NORMAL LOUNGE COAT

Breast measure, 39″. Working scale, 19½″. Divisions—
$\frac{1}{2} = 9\frac{3}{4}''$; $\frac{1}{3} = 6\frac{1}{2}''$; $\frac{2}{3} = 13''$; $\frac{1}{6} = 3\frac{1}{4}''$; $\frac{1}{12} = 1\frac{5}{8}''$;
$\frac{1}{4} = 4\frac{7}{8}''$. Waist, 35″; $\frac{1}{2} = 17\frac{1}{2}''$.

it is the 7th cervical vertebra, the most prominent bone of the spine, called the *vertebra prominens*. This is the starting point of measurements.

From A, square both ways.

A–2 = $\frac{1}{2}$ scale, square out.

A–3 = Hollowest point of back, $17\frac{1}{2}''$

3–4 = 9″ always.

A–5 = Length of coat, 31″.

6–3 = $1\frac{1}{4}''$ always for normal.

4–7 = $\frac{1}{2}''$,, ,,

8 is located by running backseam through point 7 from 6 ; and

9 is located by connecting 6 with point A.

Square out all lines as indicated.

A–10 = $\frac{1}{6}$ of scale and up $\frac{5}{8}''$ for 11.

12–1 = $\frac{1}{2}$ width of back, $7\frac{1}{2}'' + \frac{1}{2}$ for 2 seams.

Square 12 up and down for guide line.

13–2 = $\frac{2}{3}$rds of scale, 13″.

14 is squared up from 13.

15 is $3\frac{1}{2}''$ always from 14.

16 is central to 12 and 13, square up.

17–16 = $\frac{1}{3}$ of scale, $6\frac{1}{2}''$.

Connect 11 and 17, and 15 and 17, forming shoulder slopes ; make width of front shoulder to agree with back.

18–13 = $\frac{1}{12}$ scale, $1\frac{5}{8}$, and out to 19 one inch.

$19\frac{1}{2}$–9 = $\frac{1}{2}$ breast measure, $19\frac{1}{2}''$ in this case.

20 is squared down from $19\frac{1}{2}$.

21–20 = one inch less than $\frac{1}{4}$ of $\frac{1}{2}$ breast ($\frac{1}{4}$ of $19\frac{1}{2}$) $- 1 = (4\frac{7}{8}–1) = 3\frac{7}{8}''$.

22–21 = $\frac{1}{4}$ of the actual $\frac{1}{2}$ waist measure in this case $17\frac{1}{2}''$ ∴ $4\frac{3}{8}''$.

This calculation works automatically for all waist increases, and is applicable to any size.

23–$19\frac{1}{2}$ = $3\frac{1}{2}''$ for making-up and button stand, etc.

24–22 = $3\frac{1}{2}''$,, ,, ,, ,, ,,

25–15 = $2\frac{1}{2}$″.
26–25 = 1″.
27–26 = 1″ and rule crease edge of lapel from 27 to top button.

The arrow marks below 12 and above 13 indicate sleeve pitches.

Front shoulders are stretched where indicated with a hot iron, to agree with canvas foundation (see Diag. 15, page 83).

In all proportionate youths and men's coats, one-half, of the breast measure forms a reliable basis for pattern production. It does not answer for juveniles, because they are undeveloped and in their transition stages.

Firms who make a speciality of juvenile outfitting obtain their patterns by a lengthy trying-out method, and the result is that they then get a range of corrected patterns which are worth more than their weight in gold. Patterns for juveniles can, of course, be produced by direct measures, but that is quite impossible of adaptation for manufacture in bulk.

It should also be carefully noted that the average man who increases in girth usually does so by an addition of adipose matter: such a condition of figure is not a normal growth. That is to say, that if a man's chest increases five inches in girth, his height should also increase one half that quantity, if he develops proportionately.

As a matter of fact he very rarely does increase proportionately: it is true that here and there, but rarer than diamonds, you do come across a huge-chested figure with height in proportion, and the ordinary scale will then be applicable.

But the average man with a chest increase over 42 inches invariably obtains the increase through lack of exercise, or a predisposition to put on fat.

In using the Breast Measure System, it is necessary then to adopt some means of calculating the proportions of the skeleton foundation inside the case of fat : in other words, to appraise the amount of abnormal fat which is an addition to his proportionate growth.

Take the case of a figure 5 ft. 8 ins., 46 chest girth, and 49 waist, a common figure in actual practice.

Half the breast would give 23 inches for a working scale, which would assume that he had added the same quantity of fat all over the body. In point of fact he has not, for all fat increase runs two-thirds to the front of figure, and one-third nicely filling in the ruggedness of the muscles at sides and back.

For all men (except in the rare cases mentioned above) over 42 chest, add to their actual chest measure a standard quantity of 40 always, *e.g.*, $(46 + 40) \div 2 = 43$, half of which gives the working scale for all points 1–19 in coat draught ; that is, a working scale of $21\frac{1}{2}$. This method is quite reliable except in cases of other additional malformations which should be readily apparent.

Careful observation should be kept for all abnormal forms such as : erect figures, noticeable because they swing the shoulder girdle backwards, causing the blades to rotate much closer together and thereby producing furrows of muscle down the centre of the back ; stooping figures ; shoulder abnormalities such as round shoulders, high or low shoulders ; location of round on shoulders whether high, middle, or low ; head forward, giving an appearance of roundness to shoulders ; humps on one or both sides ; pigeon, or full-chested, flat-chested ; long or short bodies ; prominent hips ; flat seats, or prominent seats ; adipose additions have already been referred to.

This concludes the observations on the proportionate

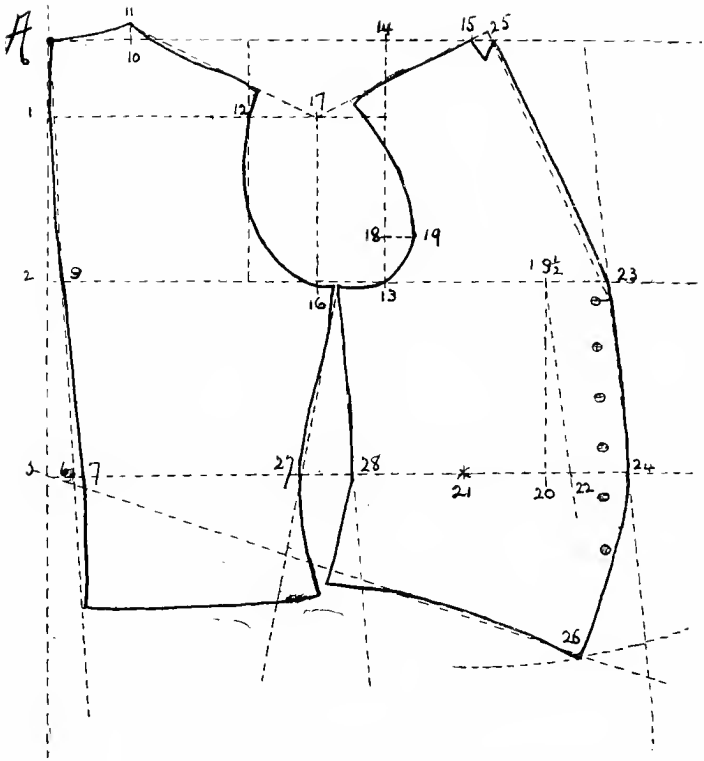


DIAGRAM 2

PROPORTIONATE NO-COLLAR VEST

Measures 39″ Breast; 35″ Waist. Working scale, 19½″.
Length 27″. Opening 14″.

breast measure method. It has proved successful in the hands of many cutters, and with some modifications has been used ever since the mind of man attempted to formulate scientific methods of coat-cutting.

Normal No-Collar Vest, Diag. 2

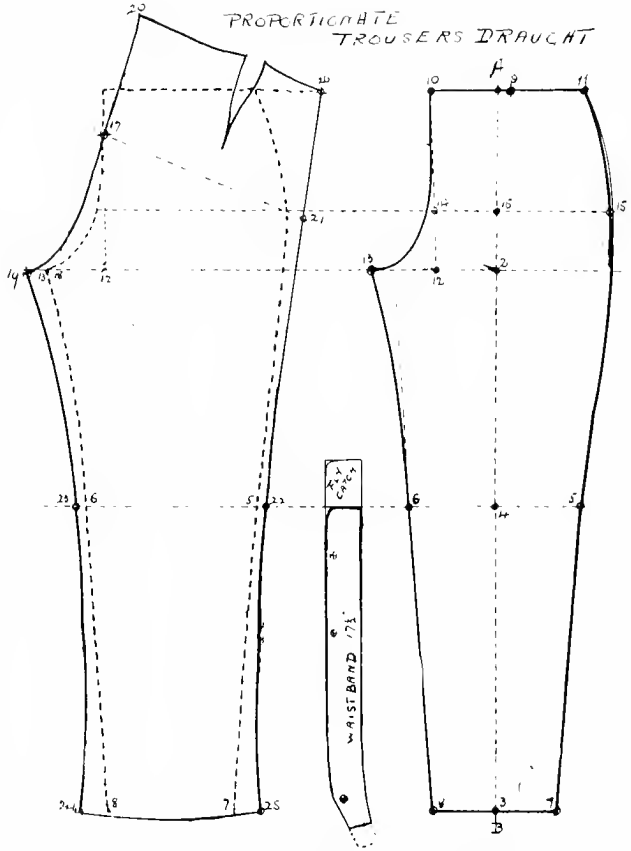
Instructions for Drafting

2–A = $\frac{1}{2}$ scale, $9\frac{3}{4}$″.
3–A = Hollowest part of back, say $17\frac{1}{2}$″.
6–3 = 1″ and draw line through this point from A, hollowing waist at 7–$\frac{1}{2}$″.
1–2 = $\frac{1}{3}$ scale.
12–1 = $\frac{1}{3}$ scale + $1\frac{1}{2}$″.
13–9 = $\frac{2}{3}$ scale, 13″, and square up to 14.
15–14 = $3\frac{1}{2}$″ for neck point.
16 is central to 12–14 lines.
17–16 = $\frac{1}{3}$ scale ; connect 11 with 17, and 15 with 17.
18–13 = $\frac{1}{12}$ scale ; 19 is $\frac{1}{2}$″ less.
$19\frac{1}{2}$–9 = actual $\frac{1}{2}$ breast and square down to 20.
21–20 = $1\frac{1}{2}$″ less than $\frac{1}{4}$ actual $\frac{1}{2}$ breast ($\frac{1}{4}$ of $19\frac{1}{2}$) – $1\frac{1}{2}$ = $3\frac{3}{8}$″ in this case.
22–21 = $\frac{1}{4}$ of actual $\frac{1}{2}$ waist measure ($4\frac{3}{8}$″ in this case.)
23–$19\frac{1}{2}$ = $2\frac{1}{2}$″.
24–22 = 2″.
25–15 = $\frac{3}{4}$″ collar stand grown on.
26–15 = vest length – A to 11 at back neck.
27–7 = $\frac{1}{2}$ of $\frac{1}{2}$ waist = $8\frac{3}{4}$″.
28–22 = $\frac{1}{2}$ of $\frac{1}{2}$ waist = $8\frac{3}{4}$″.
Complete as indicated.

Normal Trouser Pattern, Diags. 3, 4, and 5

Instructions for Draughting

Measures—outer side seam, $41\frac{1}{2}$″ ; inner leg seam, 30″ ; waist, 34″ ; seat, 39″ ; knee, 19″ ; bottom, 16″.



DIAG. 4 DIAG. 5 DIAG. 3

PROPORTIONATE TROUSERS DRAUGHT

Working scale = $\frac{1}{2}$ of 39 seat = $19\frac{1}{2}$" in this case.
Construction lines are dotted for the sake of distinction, but not in actual practice.

Draw centre line A to B.

A–3 = outside seam, less $1\frac{1}{2}$" deducted for waist band, 40".

3–2 = inner leg seam, 30".

4–3 = 2" more than $\frac{1}{2}$ leg, ($\frac{1}{5}$ of 30) + 2 = 17".

16–2 = $\frac{1}{6}$ of $\frac{1}{2}$ seat = $3\frac{1}{4}$".

Square all lines so located.

5–4 = $\frac{1}{4}$ of knee measure, $4\frac{3}{4}$".

6–4 = ditto.

7–3 = $\frac{1}{4}$ bottom less $\frac{1}{2}$", ($\frac{1}{4}$ of 16) – $\frac{1}{2}$ = $3\frac{1}{2}$".

8–3 = ditto.

Point 9 is $\frac{3}{4}$" from centre A for any size trouser.

10–9 = $\frac{1}{4}$ of $\frac{1}{2}$ waist, $4\frac{1}{4}$" in this case.

11–9 = $\frac{1}{4}$ of $\frac{1}{2}$ waist = $4\frac{1}{4}$" ,, ,,

This principle automatically finds the correct front point of waist for any size of waist.

12–2 = $\frac{1}{6}$ of scale, $3\frac{1}{4}$".

Connect 12 and 10, locating 14.

13–12 = $\frac{1}{6}$ of scale plus $\frac{1}{4}$".

15–14 = $\frac{1}{2}$ of $\frac{1}{2}$ seat = $9\frac{3}{4}$" in this case.

This completes top halves.

Under Halves of Normal Trousers, Diag. 4

Cut out top half, Diag. 3, and lay it on another piece of paper or cloth and proceed.

The laid-out top half is indicated by dotted outline. Measure up on line 12–10 to locate seat angle 17.

17–12 = $\frac{1}{3}$ of scale + 1".

Draw a guide line from 18, which is $\frac{1}{2}$" inside 13 upwards through point 17, springing out to 20 at $\frac{1}{4}$ scale less $\frac{1}{2}$" beyond, or above dotted outline of top half.

19–13 = 1″.
21–17 = $\frac{1}{2}$ of $\frac{1}{2}$ seat plus 2″, $(9\frac{3}{4} + 2) = 11\frac{3}{4}$″ in this case.
22–5 = $\frac{1}{2}$″ for 2 seams.
23–6 = ditto.
24–8 = $1\frac{1}{2}$″ } These amounts make up the total width
25–7 = $1\frac{1}{2}$″ } of bottom, viz., in this case 16″, plus 1″ for 4 seams.
26 is located by running a line through 22 and 21.

The top 20 to 26 to be reduced by fish to $\frac{1}{2}$ of $\frac{1}{2}$ waist, plus $1\frac{1}{2}$″ for seams in this case 10″.

Connect 19–23–24 by a graceful curve.

In making-up points 6 and 23 must be notched and sewn together, also points 5 and 22.

This trouser system operates for all sizes, and gives excellent results.

The trouser system presented, automatically operates for all increases of waist measures, placing the correct amount at front as required by figure. Point 9 is in every case $\frac{3}{4}$″ back of centre A, and locates centre of the waist plane section, point A being the centre line running through knee and ankle, *i.e.*, the CENTRE construction line.

In using any trouser system, great care must be taken to watch-out for abnormal changes of figures as affecting trouser cutting.

Some are, flat seat, which is very common, requiring a straighter seat angle; prominent seats, prominent hips, small waists usually found in public school lads who train as gymnasts, bow legs, knock knees, quarter-to-three feet, pigeon toes, prominent calves, flat feet, erect figures, and stooping figures.

Make a keen study of figure formation and form-growth—you cannot succeed as a cutter until you have become proficient in reading FORM.

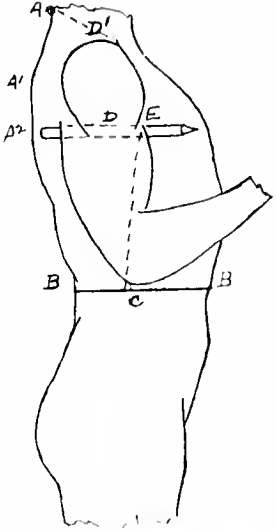


DIAGRAM 5A

DIAGRAM ILLUSTRATING HOW TO TAKE DIRECT MEASURES

A′ refers to remarks upon shoulder measure, *vide* letterpress page.

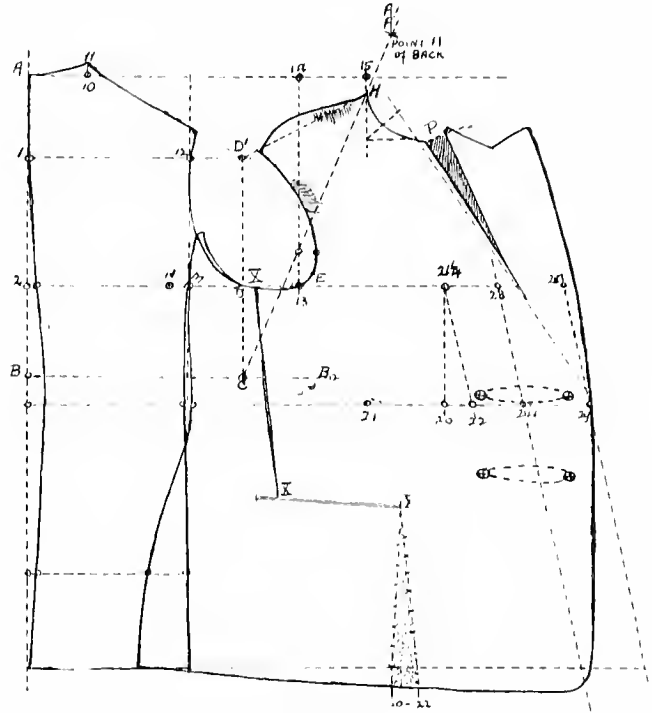


DIAGRAM 6

How to Take Direct Measures for Coats and Vests, Diagram 5A

Request your client to remove his coat.

1. Place a piece of string, tape, or narrow elastic with a clip, around waist as at B—B resting on prominence of hips, and rapidly adjust this parallel with the ground. (Tape is fastened upon vest or blouse.)

2. Measure from the *vertebra prominens* at A to the tape at B, say $15\frac{3}{4}''$.

3. Insert a blacklead pencil (or other rod) underneath the arm, close up to armpit as at E–D. Then measure upwards from tape at C to top edge of pencil at E, say $4\frac{3}{4}''$.

4. Place end of tape on A, bring it closely over the shoulder, close down the front of arm at E, to tape at C, say $18\frac{1}{2}''$.

5. With the arm resting lightly at side, measure circumference of armhole around D′–D, let tape pass over prominent acromion bone, and do not take it tight or loose, say $19\frac{1}{2}''$.

The client then replaces his coat, and the measures are taken on it as shown for Diag. 1.

Length, $31''$; $\frac{1}{2}$ back $7\frac{3}{4}''$; elbow, $20\frac{1}{2}''$; cuff, $31''$; chest, $42\frac{1}{2}''$; waist, $41\frac{1}{2}''$.

This figure has abnormally high round back-shoulders, front shoulders short in comparison.

Double-breasted Coat by Direct Measures

Instructions for Draughting

The letters indicating measures on the figure are reproduced in the draught.

A to B = the measure taken to tape, $15\frac{3}{4}''$ in this case.

B upwards to 2, D, E line = the side measure taken from the tape to the pencil, $4\frac{3}{4}''$ in this case.

1–2 = $\frac{1}{3}$ of scye = $\frac{1}{3}$ of $19\frac{1}{2} = 6\frac{1}{2}$".

D to D' = the same quantity.

12–1 = width of $\frac{1}{2}$ back + $\frac{1}{2}$" for 2 seams, and square up and down.

("Scye" is the trade term for the circumference of the armhole.)

From where 12 line crosses D line at M, come back to N 1", for the reason that two seams have been added at 12, and also for the reason that in taking the "scye" measure the tape overlaps a part of the $7\frac{3}{4}$" width of back.

N to 13 = $\frac{1}{3}$ of scye = $\frac{1}{3}$ of $19\frac{1}{2} = 6\frac{1}{2}$".

14 is squared up from 13.

15 is $3\frac{1}{2}$" in front of 14, and square a short line downwards.

The measure taken upon figure from A, over the shoulder, down to C = $18\frac{1}{2}$". Add 1" to this, making $19\frac{1}{2}$", and apply from C on diagram up to A = $19\frac{1}{2}$". Come back from A to neck point H, $3\frac{1}{4}$" the same quantity (which is optional in this system) as A to 11 on the back neck.

All other points are found exactly on the same principles as elucidated in Diag. 1, coat draught. P is a dart taken out to produce a soft roll and a soft curve to crease row, which will not be pressed dead.

23–$21\frac{1}{4}$, and 24–22, are each $2\frac{3}{4}$" to get the centre line of fronts when making-up is absorbed.

28 and 29 beyond 23 and 24 is the double-breasted lap, viz., $3\frac{1}{2}$" in this case, but may be made to taste.

On referring to Diagram 6, it will be noticed that the system adds to front of coat, an automatic increment in waist section to agree with the amount which the figure increased at that point. When the waist measure exceeds the chest measure a figure is said to be corpulent : the system provides for this, but as such figures

recede again below the abdomen, it will be necessary to reduce the bottom edge of coat, by taking out a Donlon Wedge, a method presented to the profession many years ago by Mr. P. Donlon.

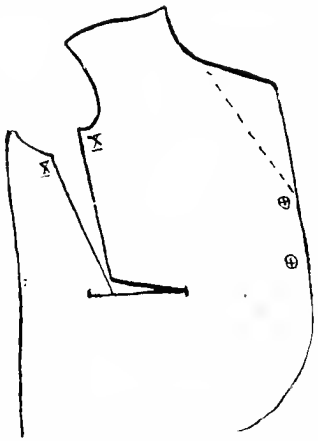


Diagram 7

Cut out the pattern as draughted. Take out of bottom edge the same amount as increase 20 to 22. Mark this on pattern from front end of pocket mouth, X to 20-22, and fold this wedge over, after cutting underarm-cut and pocket-mouth, X–X–X.

It will then be found that the pattern opens exactly as shown in Diag. 7 ; when the cut X–X is sewn up and the pocket flap inserted, a cavity will be formed in the material to receive the mountain (more or less) of adipose increment carried on the front of abdomen.

Female Figure

The female figure has very marked anatomical distinctions, which cannot be elaborated here. Suffice it to say that compared with the male, her shoulder development is in lesser proportion to her chest girth.

It becomes necessary then to evolve a scale that indicates the relative shoulder development to the chest girth.

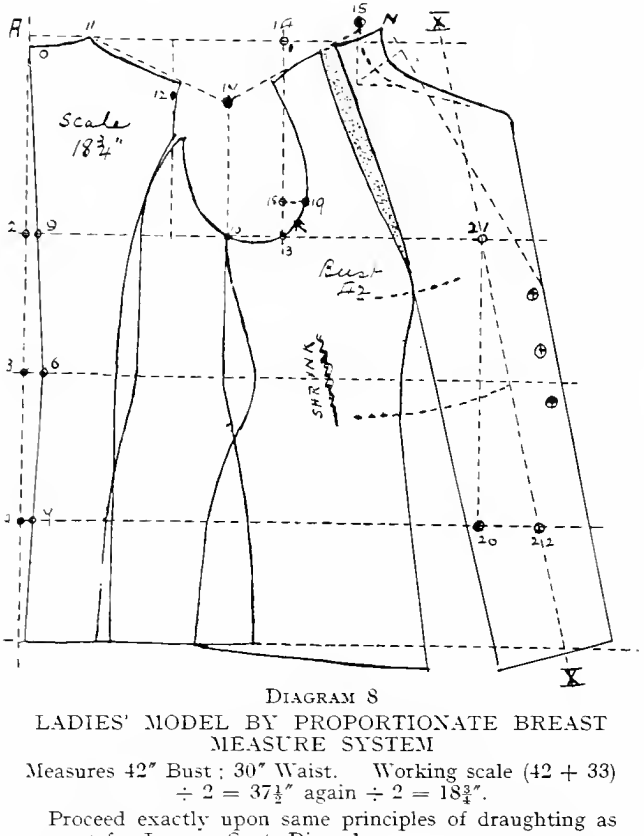


DIAGRAM 8

LADIES' MODEL BY PROPORTIONATE BREAST MEASURE SYSTEM

Measures 42″ Bust ; 30″ Waist. Working scale (42 + 33) ÷ 2 = 37½″ again ÷ 2 = 18¾″.

Proceed exactly upon same principles of draughting as set out for Lounge Coat, Diag. 1.

No seams are included, they must be added everywhere except front edge.

10–A is lowered ½″ because ladies' coats show more neck than the male—this is in keeping with the grace and contour of the female neck which has anatomical distinctions from the male.

13–9 = ½″ less than ⅔ scale.

15–4 = 3½″, the standard neck point.

When the distance from centre line at X to 15 measures more than 3″, split the fronts bringing point 15 to X. This is only necessary in full-busted figures.

20–22 = 3″ always, except in loose coats when it is 1″ only, this obtains the run of fronts.

In the male, the mean size is 36″ chest ; in the female, the mean size is 33″ chest.

For unmatured girls up to 32″ chest, the shoulder sections are correctly formed by a working scale equal to half the chest girth as in males.

Over 32″ female bust it is necessary to deduct 2″ for the mammary gland development, so that for the middle chest sizes, 1″ less than ½ bust measure gives a satisfactory working scale for shoulders, *i.e.*, sizes 34″ to 38″ bust measures.

LADIES' PROPORTIONATE MODELS

For Draughting Patterns

Bust Measures.		*Shoulder Scale.*
24″	=	12″
26″	=	13″
28″	=	14″
30″	=	15″
32″	=	15½″
34″	=	16″
36″	=	17″
38″	=	18″
40″	=	18½″
42″	=	18¾″
44″	=	19¼″
46″	=	19¾″

Females who develop busts over 38″ do not develop such according to Nature's laws of form-growth (always excepting the rare type of figure as dealt with fully in discussing the male figure, where the height *is* proportionate to the chest girth). Female form is largely due to corset fashion, and it is necessary to be keenly observant of the variations in form due to this.

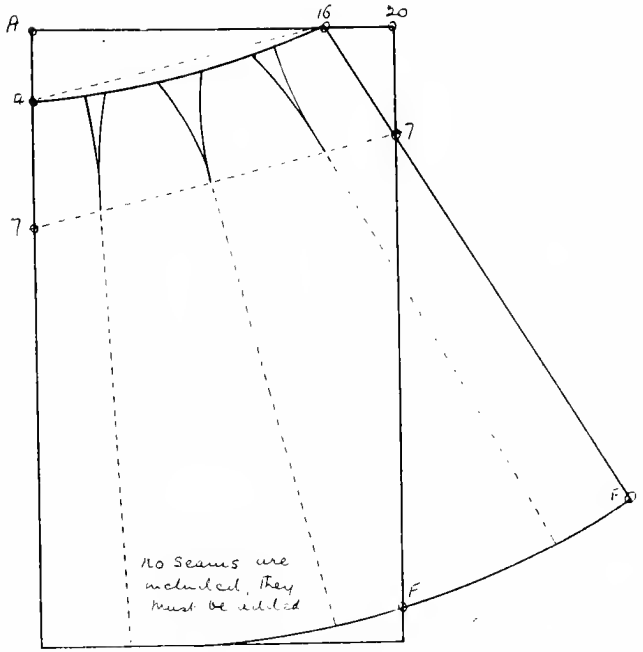


DIAGRAM 9

No seams are included, they must be added

LADIES' SKIRT-CUTTING

The basis underlying Skirt-Cutting is very simple, inasmuch that all that is necessary is to reduce the width required by the *Hips* to agree with the *Waist* measure.

Example—

Hips 40″	Waist 24″
$\frac{1}{2} = 20''$	$\frac{1}{2} = 12''$

The difference between 12 and 20 = 8″, which is the amount of waist suppression.

According to the same laws of form-growth dealt with for the male figure, it will be necessary to appraise the skeleton proportions upon which are superimposed the lengths and widths of shoulder sections (the chest girth always locating the quantity of material necessary to wrap round the body).

For all bust sizes over 38″ add a standard quantity of 33, and divide by 2.

For example, bust (46″ + 33) = 79. 79 ÷ 2 = 38½. ½ of 38½, *i.e.*, 19¾, gives the proportionate size of shoulder sections.

Instructions for Skirt, Diag. 9

The parallelogram based on A represents the width of material required to contain the hip dimensions 20″ in this case.

A to 20 now requires to be reduced to waist size 12″.

Whatever the waist suppression is according to the figure, make from 20 to 16 half of that quantity (½ of 8″ in this case).

Make A to 4 the other ½, viz., 4″.

Connect 4 and 16 hollowing 1″.

The *hip line* 7–7 is always 7″ from waist line 4–16.

Wherever 7″ strikes the vertical 20–F run the back-seam of skirt throwing on an amount of fullness for walking F to F. Then reduce the oblique line 4–16 to the actual waist measure net, by taking out darts. Gores are a matter for fashion or taste.

This forms a reliable basic system for all skirt cutting.

The system of *Direct Measures* here presented is the simplest, most exact, and expeditious yet submitted to the profession. It is based on a combination of measures, each one of which has been approved at some time or other during the last 100 years. Scientific data and reasons underlie each one, and moreover it is a

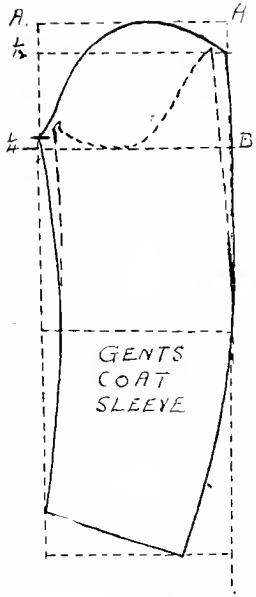


DIAGRAM 10
Gent's Coat Sleeve

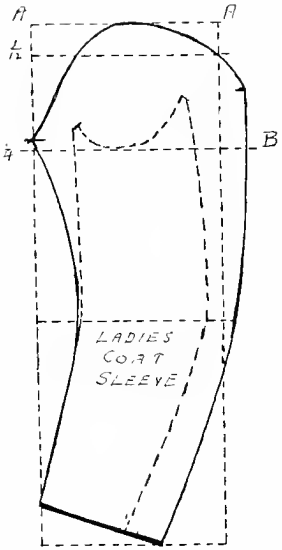


DIAGRAM 11
Ladies' Coat Sleeve

SLEEVES AND COLLARS

Measure neatly around the *scye* of Coat pattern, say for example 18″; this forms the working scale.

Square both ways from A. A to B = $\frac{1}{12} + \frac{1}{4}$ scale.

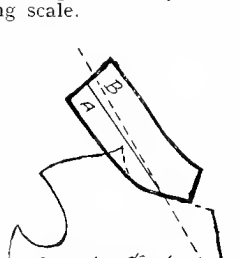
Line B–B = the line 9.16.13 on the coat draught.

A to A = $\frac{1}{2}$ scale 9″.

Underhalf sleeves indicated by dotted outlines.

Follow diagrams which are $\frac{1}{5}$ scale actual size.

A = Collar Stand
B = Fall of Collar



combination of the fewest possible direct measures which give adequately the balance, and sectional developments of abnormal figures.

It is necessary before leaving this subject to caution the reader against the error of imagining that abnormal figures are only monstrosities.

The figure for which the coat in Diag. 6 was cut is an abnormal figure—abnormal, inasmuch as his figure has somewhat departed, influenced by hereditary or extraneous forces, from Nature's laws of proportionate growth.

Nevertheless, to the casual observer, he would appear as a good type of figure: as a matter of fact he is a well-known public gentleman of commanding appearance, yet if the development as depicted in his coat is compared with the normal in Diag. 1, it will readily be seen that the back-balance is greater and the front-balance less than the proportionate coat and figure balance indicated in Diag. 1, which is absolutely true to proportionate form-growth.

The Direct Measure System here given is applicable to all figures, male or female, and for the production basis of all and every kind of body garment.

The amplification of the science of cutting and the systems here recorded showing abnormalities which are found in practical work, and their working adaptation to all the styles of garments affected by males and females, runs into many hundreds of pages. Those who are keenly interested may consult the Publishers or the Author.

CHAPTER V

MAKING-UP

HERE again the subject is divided into the *modus operandi* appertaining to the two main branches of the trade.

I. Wholesale—
Stock ; Wholesale Bespoke.

II. Retail—
Bespoke ; Individual.

In no other process of the trade is the divergence between I and II so marked as in the making-up of garments. In measuring and cutting, in pattern cutting and marking-in, in order taking and pressing off, the gulf between the two branches of the trade is nowhere more apparent than in the making-up.

In times almost now forgotten, the Bespoke Tailoring was the only known manner of garment production.

Upon the basis of this practice was built the gigantic superstructure of Commercial Tailoring, *i.e.*, the Wholesale or Factory Branch of the trade.

While the years rolled onward, the factory system moved forward from stage to stage until it now dominates the clothing industry. Undoubtedly the advent of the sewing machine gave the impetus to this industrial development.

The methods of retail making-up linked in an unbroken chain with the far-distant past ; methods which in the early Victorian era made it possible for a working man to possess a suit of clothes made for himself once in a lifetime ; methods which have marched onwards to a slower step than possibly any other industry ; upon

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such methods, live men with commercial instincts elaborated the factory system which gave to working men, however poor, the opportunity of possessing a new suit at least once a year.

The first phase of this development was the taking of the Retail Methods and deleting the whole or almost the whole of hand-sewing (*vide* section on Retail Making).

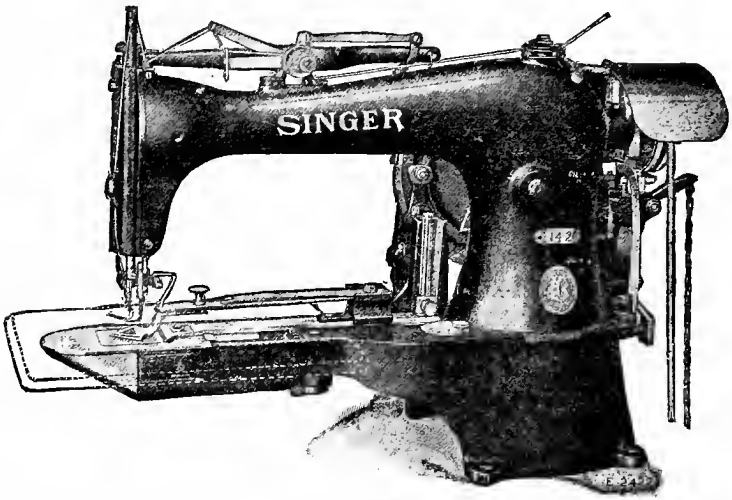


DIAGRAM 1
MACHINE No. 114–20

In the early days, garments were booked out to the machinist, who did the whole of the work almost entirely by machine, getting it ready for the presser-off, buttonholes, and buttons.

In course of time the trade began to assume three main divisions, *i.e.*, Machinists, Finishers, Pressers. The machinist commenced the coat and made it up to the stage when hand work was necessary; it then was

passed to the finisher, who fastened (serged, as it is termed) the linings around the armhole, built up the sleeve heads, felled the tops of sleeve linings to the coat, pulled out all the basting-stitches (if any were in), and passed to presser, who pressed-off the garment ready for buttoning and shipping. In course of time, mainly owing to the great influx of alien Jewish labour, the work

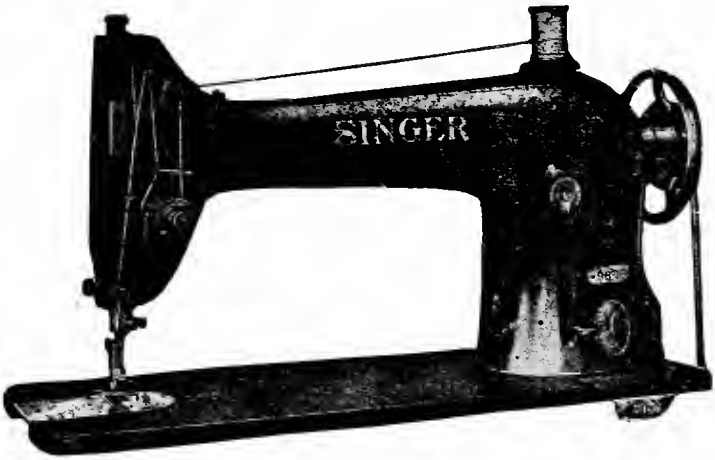


DIAGRAM 2
MACHINE No. 96-16

became still more divided. For example, the original Jewish method was to divide the making (*i.e.*, machining) of a coat into three sections, viz., Outsides, Insides, and Sleeves. The object of this was to introduce and find employment for hundreds of the same race who flocked through the ever-open doors of our national dump-heap. The Sectional Method was introduced for two reasons mainly; firstly, production was accelerated, bringing in bigger earnings; and, secondly, it was notorious

that persons with no previous skill could in a few weeks be made into producers. These people mainly worked in their own homes, and of course practised the Con-

Diagram 2a

tinental habit of whole families, from the infants to the parents, working on the same work. Being impoverished, and accustomed to the then very low standard

of Continental living, they sought for and took huge quantities of garment-making at rates which undercut and drove out the British worker to an incredible extent. Those who were forced to follow the trade were thus

DIAGRAM 3
(Zig-zag Stitching or Overcasting Stitch)

likewise forced to work to a low standard, and so introduced the practice of sweating, which became so notorious that Parliament had to take a hand in the game.

The Sub-Divisional Method cheapens production,

enables inferior processes to be operated by unskilled or child labour, retaining the better skilled labour for

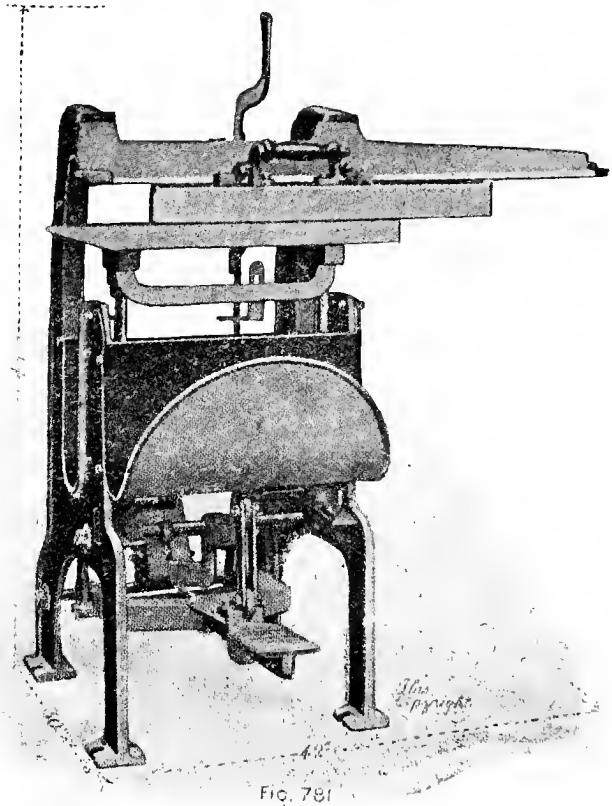


Diagram 4

the more difficult parts. It is claimed also that this method develops specialists in particular branches or operations of manufacture.

So appalling was the effect of cheap divisional labour upon the trade that it acquired a reputation beneath contempt ; the trade received a blow the effects of which were only removed by the eradicating furnace of the Great European War. A person occupied in the

DIAGRAM 5

MACHINE No. 55—3

clothing industry had to carry about a Chinese praying-wheel, perpetually muttering imprecations and apologies for ever daring to be engaged in the covering-up of Nature's nakedness.

Yet, although it had never been recognized, it requires more individual skill to make garments than it does to use a capstan lathe or a radial drill for which an operative

would be designated an engineer or a mechanic. The purifying furnace of the Great War has revolutionized the status of the clothing operator.

Although the exploitation of cheap labour formed an important factor in the rapid development of the wholesale branch of the clothing industry, yet it was not the primary factor. Were it not for the tremendous

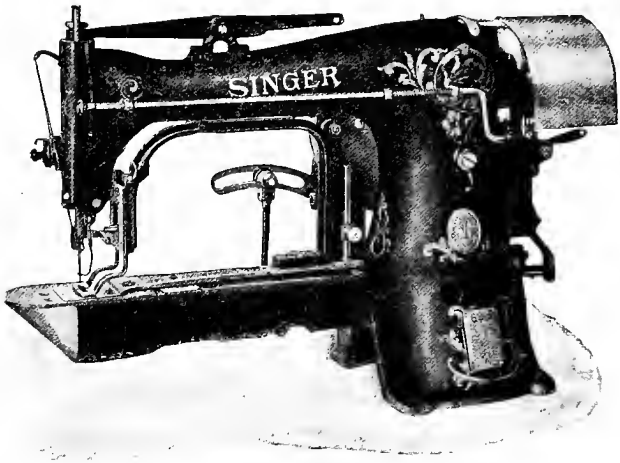


DIAGRAM 6

MACHINE No. 69–8

impetus given to the clothing trades by the pioneer Singer Sewing Machine Company, the trade would be half a century behind its present position to-day. It is difficult to measure in words the invaluable support and push given to the wholesale trade by the enterprising Singer Sewing Machine Co., Ltd.

In spite of the lessons of the past, clothing manufacturers in this country (and also others) continue to take short views of commercial possibilities.

They are ignorant of the economic law of diminishing returns. Profits are often made at the expense of human energy, health, and life.

In point of fact modern methods do not aim at profit production—that is inherent in the system subject to the operations of above-mentioned economic law. Modern methods aim at—

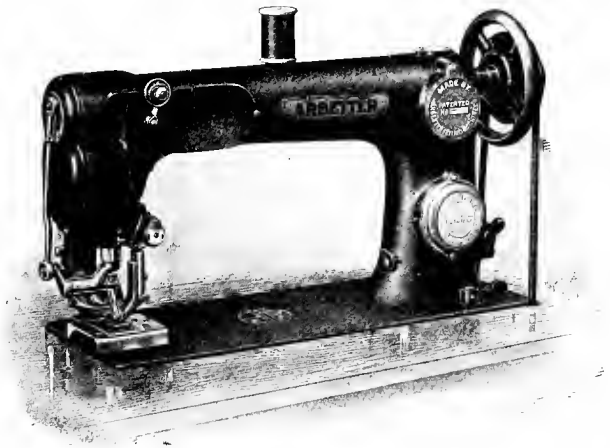


DIAGRAM 7

(*a*) Efficiency—unbroken efficiency whatsoever be the strain of critical periods.

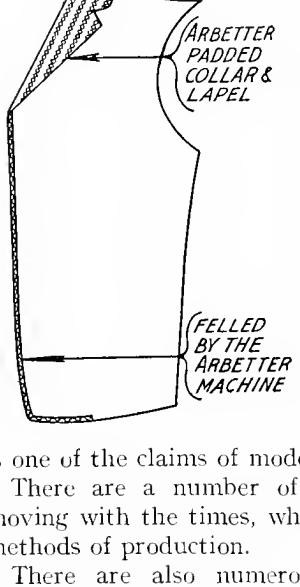
(*b*) Efficiency, that obviates the devitalizing, soul-killing effect upon the human operatives.

Modern methods give all that older systems of production ever gave. In addition, modern methods give increased production, and a higher standard of production with shorter hours, and without creating human wrecks.

It has been asserted that modern methods create a

monotony which robs the operative of interest and so develops mere human automata.

In reply to this, it can be truthfully asserted that no system can be more exhaustive of human energy and interest, than the older methods still existing. Again, no operations could well be more monotonous than those in the Ford Motor Car Factory. The Ford Company speedily recognized that the psychological factor of human labour could not be ignored if the acme of efficiency was to be maintained. It is well known that the company introduced a system which reduced monotony to a lower index than was ever possible with older methods.



Yet, again, the writer knows no factory working on the older systems where the slightest effort has ever been made to relieve monotony. That objective is one of the claims of modern methods.

There are a number of progressive manufacturers moving with the times, who have adopted modernized methods of production.

There are also numerous others whose methods varying little from the early days are still in operation.

There can be no doubt that similar systems of production that the writer here lays down will predominate the whole clothing industry during the next decade. The wholesale trade is now passing through a transition

period: shorter hours, better pay, and a higher (much higher) standard of production is demanded. Some interested in the trade claim that the whole of the operations on garment making can be performed by specialized machinery. The writer is not one of that group. In any garment that is removed from the "slop" category, *form* is essential, and a modicum of hand work is necessary to obtain that effect.

The system as laid down here is in operation in one of the largest factories in New York where a very high standard of production is aimed at.

When the work is cut, trimmed and tied in bundles ready for making-up, it passes to the factory manager, who assumes control. It must be distinctly understood that the operations here described are not simultaneous. It is a description of the system in full swing.

SYSTEM FOR PRODUCING 1,000 LOUNGE COATS

Operation.	*Number of Operatives.*	*Machine.*
1. Open bundles, attach tickets to all sleeves in pairs, all linings, all outsides. Each ticket is ruled in squares so that every operator who handles the part may insert her No. under the work space indicated.	One.	Singer Ticketing Machine 114-20, Diag. 1.
2. Trimmers, often called fitters-up, who adjust the sizes of the linings leaving only sufficient that the linings may make up equal to the outsides.	Four.	By hand.
3. Pocket makers.	Four.	Singer, 96–16, Diag. 2.

Operation.	*Number of Operators.*	*Machine.*
4. Seams serged where the material is of a loose ravelling nature. This operation enables the correct amount to be consumed in the seams without breaking away.	One.	Singer, 81–1, Diag. 3.
5. Linings piecing up.	Two.	Singer, 96–16, Diag. 2.
6. Coat joined. Sides and back seams only.	Four.	Singer, 96–16, Diag. 2.
7. Sleeves and sleeve linings piecing up. If operators are careless it will be necessary to ticket each sleeve (operation 1).	Two.	96–16.
8. Sleeves marked for turn-up and material basted in to give firmness to cuffs.	Two.	By hand.
9. Sleeves pressed.	One.	Ibis Pressing Machine, Diag. 4.
10. Sleeves and sleeve linings paired. The linings will carry a gummed tab or number written in lead pencil by the fitter-up.	One.	By hand.
11. Sleeve linings basted in, and open cuffs formed.	Three.	By hand.
12. Seams of coat pressed.	Four.	Pressing Machine, Diag. 4.
13. Canvases made.	Four.	Singer Basting 55–5 Machine, Diag. 5. 107 W 3 may also be used.
14. Canvases pressed to shape.	One.	By hand.
15. Canvases basted into foreparts of coats.	Three.	By hand.
16. Pockets tacked.	One.	Singer, 69–8, Diag. 6.
17. Collars made and padded.	One.	Arbetter Machine, Diag. 7.

Operation.	*Number of Operators.*	*Machine.*
18. Shoulders and collars joined.	Two.	Singer, 96–16.
19. Lapels padded, and bridle padded in.	Two.	Arbetter, Diag. 7.
20. Shoulders and collars pressed.	One.	Pressing Machine, Diag. 4.
21. Inside breast and ticket pockets made.	Two.	Singer, 96–16.
22. Coat shaping, *i.e.*, lapels and collars adjusted, uneven edges removed, etc.	Two.	By hand.
23. Facings basted, *i.e.*, underbasting.	Four.	By hand.
In lower grades of trade, operation effected by Singer Baster, 55–3.		
24. Bag round edges sewing a $\frac{3}{4}$″ tape in to the correct tension at the same operation.	Two.	Singer Bagging Machine, 61 W 42. Throw knife out of action on this machine, Diag. 8.
N.B.—In lower grades of work this machine in the hands of an experienced operator will do operations 23, 24, and 27 simultaneously.		
25. Edge taping felled. Operation 24 leaves a loose inner edge to tape and a loose edge of canvas.	One.	Arbetter, Diag. 7.
26. Edges pressed open.	One.	By hand.
27. Edges trimmed around.	One.	By hand.
28. Overbasting, *i.e.*, edges turned out and basted, fronts and collars basted over.	Seven.	By hand.
29. Bottoms felled, *i.e.*, turn-ups flash-basted.	One.	By hand. The Arbetter may be used, Diag. 7a.
30. Linings basted around bottoms and back vents.	Two.	By hand.
30a. Pressing edges thin.	Four.	Pressing Machine, Diag. 4.

Operation.	*Number of Operators.*	*Machine.*
31. Coat stitched.	One.	Singer, 96–16, Diag. 10. If double-stitched edges use 22 W double needle machine, Diag. 9.
32. Sleeves sewn in.	Two.	Singer Sleeving Machine 47 W 11, Diag. 11.
33. Armhole seams pressed open.	One.	By hand.
34. Armholes basted, *i.e.*, serged and wadded.	Four.	By hand.
35. Coats felled.	Ten.	By hand.
36. Button-holes marked.	One.	By hand.
37. Ditto cut.	One.	Singer Buttonhole Machine, 23–12.
38. Ditto made.	One.	Singer ditto, Diag. 12.
38a. Bar-tacking holes.	Ten.	By hand. This operation may be done by machine in cheaper work, Diag. 6.
N.B.—One machine cuts holes. The other makes them.		
40. Bastings pulled out and ends clipped.	Two.	By hand.
41. Pressing-off.	Twenty.	By hand. *Vide* chapter on Pressing.
42. Buttons marked.	One.	By hand.
43. Buttons sewn on.	Five.	By hand. May be done by Machine 69–5, Diag. 13.
44. Coats thoroughly examined, and any ends clipped.	Three.	By hand.
45. Coats brushed and shipped to stock-room by trolley.	One.	By hand.

N.B.—The foregoing operations vary considerably in the degree of skill demanded.

In the hands of a capable organizer, the scheme works as smoothly as clockwork.

Compared with Retail Tailoring Methods, this system

DIAGRAM 8

MACHINE No. 61W42

(*Open Tensions and Tape Holder*)

requires but one-third of the number of operators, and those of varying skill and ages.

Sub-divisional Methods permit of the worker leaving work without that jaded, exhausted feeling that is the effect of heavy through-working.

It also permits of the employment of Specialized Machines, such as have been invented by the Singer, or the Arbetter Companies to give the nearest, if not the facsimile, result as is obtained by the extensive hand work in Retail Making-up.

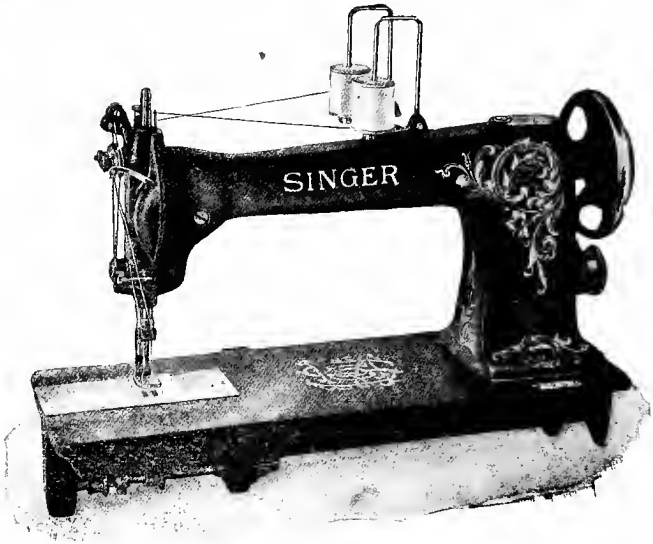


DIAGRAM 9

MACHINE No. 22W

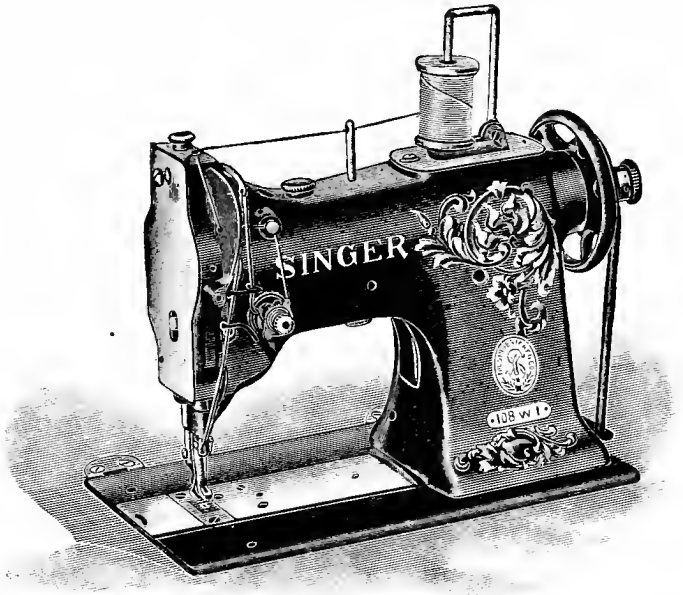
Two-needle Machine

All the excellent resultant effects of these specialized machines must be lost if some form of sub-divisional work be not adopted, hence it follows that divisional labour is the only scientific method under which well-tailored garments can be produced in quantities sufficient to meet the requirements of the people.

If such depended upon the retail tailor, the condition

of society would revert to the one-suit-a-lifetime period, for the fact cannot be controverted that really skilled retail tailors are as scarce as artists.

Given the necessary specialized machinery and a well-balanced method, the success, or otherwise, of modern methods of production depends upon the ability



of the organizer. Organizing ability in this country is at a discount. Employers frequently advertise: "Must have held a similar position," consequently brains are in-bred like the English bull-dog, and so suffer in vitality. Not so the American employer; he backs his own judgment, not another's. Employers on this side would be surprised to know from what

material most of the leading entrepreneurs of the U.S.A. were developed. The American employer is ever on the look-out for brains that offer signs of development under suitable environment—he tries them out and hence he obtains in his business his own brains plus many more brains—result, progress.

DIAGRAM 10

Hampered by ancient conventions, the employer in this country requires his managers to think as he thinks; in other words, he demands many replicas of one brain, and so, with many employees, he yet possesses a one-brain concern.

There is much scope for employment in garment making, there is a dearth of highly skilled operators, and as within the next few years the greater part of clothing now made in retail shops will be made in factories, a very much higher degree of skill will be demanded.

DIAGRAM 11

SLEEVING MACHINE No. 127W1

Usually girls on leaving school enter this trade on the lowest rung of the ladder, and work a few years until they gradually acquire increased skill.

In London and in Leeds, the technical schools offer facilities for technical training in this subject to those parents who are able to keep their children out of the labour market for six or twelve months, and who can pay a small fee for technical instruction.

DIAGRAM 11A

Modern methods for the production of 1,000 vests, and 1,000 trousers are not included in this issue ; they will be inserted in a future edition if the need be apparent.

The most successful factories are those in which the training of operators has not been ignored.

If this country is to maintain its hold of the clothing industry, manufacturers should train, and highly train, their operators, and train also in more than one process. This country has not yet touched the fringe of the Export Clothing Trade—there are huge possibilities.

Every American concern of any reputation devotes considerable time, energy, and money to the training of their staff of operators.

Section II

Retail—Bespoke—Individual

Original processes of garment-making whose inception is buried in the long distant past have been handed down to the present through a species of craft freemasonry, conservative, subtle, and tedious.

Except for the reason that orders come in singly, and hence slowly, the method of sub-division already indicated would serve equally well for the majority of garments termed " Bespoke."

Let it be distinctly understood that the objective of true bespoke tailoring cannot be clearly stated in words. To truly appraise it, necessitates an aesthetic education not cultivated by the million.

To the majority, a coat is a coat, but the few who are gifted with observation, or trained to see, know that between two coats made of the same material there can be such a difference that words could but inadequately denote it.

It is such a difference as is *felt* to exist between a masterpiece and a cleverly executed copy.

The work of the ablest cutter is often marred by indifferent tailoring.

The acme of tailoring is *not* the well-set, smoothly-ironed, plaster-cast clothing so often mistaken for the highest class of work.

Craft-art gives a garment correctly proportioned and balanced to the figure, supple, giving to the movements of the wearer, yet retaining a mould of fashion which never departs, however old the garment be.

Poor material exquisitely tailored would carry a distinctive grace which the best of material poorly put together could never emulate.

The best tailors are artists, and they have not for the

past quarter of a century existed in sufficient numbers to supply the demand. Very high-class English tailoring has been worn, admired, and sought after by the *élite* of Europe and America. For several decades these highly skilled craftsmen have been dying out, and it is

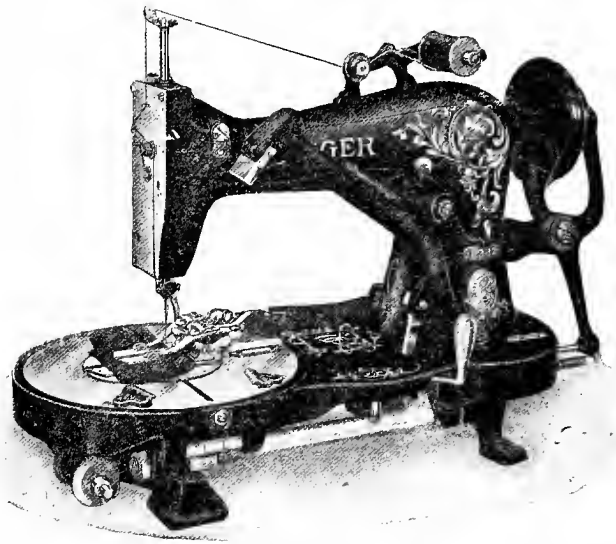


DIAGRAM 12

BUTTONHOLE MACHINE No. 23-12

questionable whether they will be replaced by the newer order of operatives. Certain it is that the demand for the best class of sewing-tailors will not be met for many years to come.

In this branch of the trade, tools and machines add nothing to skill and little to knowledge, the grace imparted to garments exudes (as it were) from the

finger tips of the tailor. It is a tedious occupation, and requires the same long-suffering patience of the fisherman sitting for hours on the bank of a stream waiting for a bite. It requires also a pride and self-glory for the work of his hands so sadly lacking in too many workmen.

The true bespoke tailoring, then, aims at *Form*, suppleness, grace, and careful, honest workmanship.

The whole of the operations upon a coat described in the previous section, would in the bespoke be done by the one man, with some exceptions dealt with later.

When the tailor gets the coat (or any other garment) from the cutter, he proceeds to fit-up the job, *i.e.*, cut the facings, flaps, welts, collars, jeatings, etc., from the pieces of material and linings wrapped up in the job.

The outsides are chalk-marked, and in many places inlays are left beyond the chalk-marks providing provision for alterations or re-cutting, which will be clearer to the reader after reading the chapter on cutting.

These inlays are then thread-marked, that is a stitch operation with white basting cotton which gives the chalk-marks a more permanent character and also transfers the shape marked, to the underneath piece of material ; all garments are cut on the double of the material with very few exceptions.

The tailor then prepares the coat for trying on ; or it may be a vest, trousers, breeches, or any other garment.

Basting. N.B.—Basting is the trade term for the operation known to the lay mind as tacking-together (*vide* dictionary).

Tacking in the trade is an operation of the most permanent character, the very opposite of basting. Tacks are put in at pocket ends (and other parts of a garment), and are made by numerous fine stitches, the

object of which is to anchor the ends and prevent them tearing away.

To resume, the tailor proceeds to prepare a baste-up for trying-on.

Baste-ups vary considerably with the custom and class of different shops. Some are satisfied with the

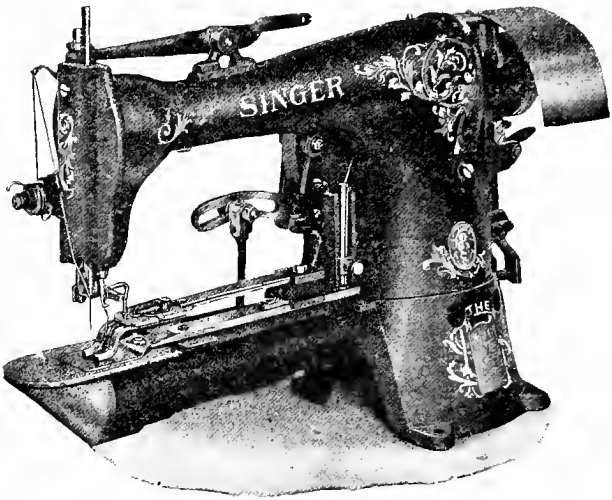


DIAGRAM 13

MACHINE No. 69-5

(*a*) *Skeleton* baste, which consists of the back joined to the foreparts in which have been inserted the plain canvases, one sleeve basted in, and a dummy try-on collar which does duty time and again.

(*b*) Some prefer a fuller baste, the canvases are properly made (*vide* Diag. 15) and hair-clothed if ordered. All the outside pockets are inserted ; the bridle is sewn o crease row ; both sleeves are basted in, and the proper

collar for the job is made and basted on. Much of this work is permanent to the job and will not have to be ripped out again.

In the best firms the custom is to have either a full-baste or a forward-baste for trying on.

(*c*) The full-baste consists of all the pockets permanently made ; all the details given in (*b*) and in addition the linings are basted in and edges and facings turned in and pressed, so that the coat may be tried on as near to the state of a finished garment as possible, and yet all the bastings can be easily ripped out after fitting-on, ready for remarking alterations required, or re-cutting.

(*d*) The forward-baste consists in having the coat actually made up in its finished state except that the sleeves and collar are only basted.

When the baste-ups come back from being tried on, they are ripped, smoothed, and taken to the cutting-room for correction and cutting off the edge inlay to agree with requirements indicated in the fit-on stage.

Operation 3. The pocket-flaps are carefully basted by hand (in fact unless otherwise indicated all operations in bespoke making-up are by hand), and so regulated that when the flap is sewn round and turned out, the lining will lie inside without showing at edges. The flap, pocket jeatings, stays, and pocketing are firmly basted in position ready for machining the seams of same—sometimes they are sewn in by hand and not machined.

No basting is resorted to in the wholesale for this operation ; the machine operator is trained to hold everything correctly in position with her fingers, feeding the work under machine foot.

Operation 13. The canvas which goes in each fore-part is very carefully moulded to form (*vide* Diag. 15). Sometimes soft haircloth, or another piece of canvas,

DIAGRAM 14

or a piece of cloth is put through the shoulder portion of the canvas, which must follow the form aimed at and be securely fastened with basting stitches.

Operation 15. The shoulders of foreparts are carefully stretched, shrunk, and manipulated to the form aimed at (Diag. 1, Chap. IV), and then the foreparts are basted on to canvases, and the pocket-ends tacked with a private silk stitch (operation 16).

Operation 17. The under collar having been cut to the shape of coat neck, made and padded in the baste-up stage, by hand.

Operation 19. Lapels padded and bridled by hand.

Operation 21. The linings may have been partly made for the baste-up ; if not they will be made now and the inside pockets inserted.

Here we part company with the method adopted in the wholesale.

We part company with the wholesale because that branch adopts what is called a **Bagging** method, *i.e.*, the outsides are made up completely, side and shoulder seams being joined up and under-part of collar sewn to neck of coat (*vide* Diag. 2a).

Likewise, the insides are made up completely, the outside part of collar being sewn to neck, and all seams pressed open (*vide* Diag. 14).

The outsides and the insides having been so carefully adjusted to one another in operation No. 2, it remains now only to lay the right sides of the linings upon the right sides of the outsides and to baste around the edges, when the coat is ready for *bagging*, that is, sewing by machine all round the extreme edges, after which the underbasting stitches are quickly pulled out and the *bag, i.e.*, the coat, is pulled either through the armhole or the back-vent, and turned out the other way. That is to say, the " bag " was sewn round with the right

sides within ; after machining round it is turned inside out, showing the correct surfaces of the materials in view, and ultimately to wear. The edges are then basted-out, and the fronts basted-over as indicated in operation No. 28 *et seq.*

That is what is termed a " bagged " coat, and is essentially an operation pertaining to and invented by the wholesale trade. Some excellent results are obtained in the hands of skilled fitters-up and basters, and because of its quickness it is practised by a large number of cheap and second-grade bespoke tailors.

The " open-made " coat, dynamically opposed to the " bagged " coat of the wholesale, is essentially the distinctive method of the individual retail bespoke.

It is the method which has come down to us through many generations of craftsmen whose names were household words in the trade, and whose skill was revered with the like unspeakable admiration that painters rendered to a Reynolds or a Whistler.

Form, then, is the distinctive of the real bespoke method ; *Bulk Production* is the objective of the wholesale.

They may meet at a certain point in the wholesale under a properly organized scientific method. Many wholesale firms attempt to copy the *form* effects of the really high-class retail, but many never attain it.

If the human figure possessed the same characteristics as a brick wall, needing but a machine-elaborated wall-paper to clothe it, the Chicago obsession of most clothing manufacturers might possibly pretend to be based upon a quasi-logical thesis.

It is possible to measure a section of a brick wall and to obtain its superficial size and shape, and to produce such exactly in a material to cover it.

It is also possible to obtain the superficial size and

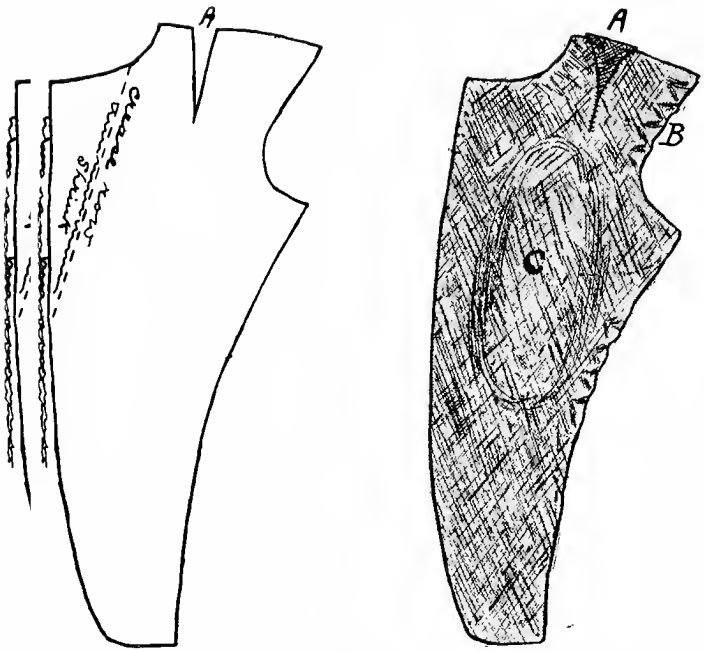


DIAGRAM 15

CANVAS FOUNDATIONS FOR THE BEST MAKE OF BESPOKE COATS

I. Split canvas at A and open, securely sewing in a V of canvas to open at least 1½". This follows the figure, *i.e.*, hollow between the two extremes of collar bone, and throws fullness at B over the prominence of shoulder bone.

II. Shrink crease row and edge shown by wavy line; use a fairly hot iron and a little clean water; work up cavity C to pan to the contour of thorax.

III. Serve the cloth foreparts the same way, except in place of splitting at A, stretch there and also at B.

These manipulations are very important and require care.

shape of a section of the human figure (*e.g.*, the trunk), but such is diametrically opposed to the characteristics of a section of a brick-wall. Any superficial section of the human figure is full of many and varied surface contours (*i.e.*, form), and of such a character that clothing of the wall-covering variety may cover, but neither fit nor grace.

This then, is the objective of the real artist in clothing, and he proceeds toward that aim by tedious and painstaking methods and much hand-sewing and form manipulation.

He builds his canvas foundations carefully to follow as near as possible to the varying contours of the body, and then manipulates the cloth foreparts by the use of a very little clean water and a hot iron of the necessary temperature.

As has already been said, most of the operations made by this class of tailor are performed by some peculiar hand-sewing stitch, each variety of stitch possessing its own peculiar function and power of effect.

Hand-sewing and hand operations possess peculiar properties which cannot be imitated by machinery.

Hand-sewing has a peculiar effect of "creeping": it draws and holds the materials in the position required, and a highly skilled tailor can obtain three different effects by "back-stitching" one seam, and moreover each of those effects aim at definite results necessary to produce a flat surface with fitting contours for the human body.

A coat well-tailored by hand will cling and sit gracefully to the figure until it falls to pieces.

Each separate forepart is canvassed and it requires great care to baste a manipulated forepart onto an already formed canvas; each separate forepart is carefully stayed in the edges, lapel padded with a peculiar

curling effect, and the crease edge of lapel drawn in and bridled : it is then ironed in such a way that the form given to it is intensified, but if care and skill are not observed, all the form already given to the supple materials will be ironed out and lost.

Each separate forepart facing and lining is made and pocketed, and carefully manipulated to the shape already attained in the foreparts themselves, and is then basted in position on its front and sewn up the edge by hand and pressed open.

Each front is then turned out, duly observing all the time, and each stitch and operation working towards the attainment of grace and form. Along such lines is produced the " open-made " coat of the retail individual bespoke trade.

The back of the coat is then sewn to the sideseams of foreparts by hand, seams pressed open with definite effects in view, and the sideseams of linings " felled " in, the centre seam of lining having been already backstitched.

Shoulder seams are then sewn, and in such a way as to give length over the back shoulder, shortness in the hollow of front shoulder, and snugness at the back scye.

The collar having already been cut to agree with the neck of coat, is padded by hundreds of peculiar stitches to give the back a curl downwards, and the collar sends a curl over the body at front. It requires then to be carefully sewn or felled to neck of coat, and this operation requires skill and knowledge, for many defects in coats seen in the streets are caused by incorrect collars. Creases in the front shoulders, or foul back scyes, are frequently caused by foul collars.

The shoulders are then made up and the sleeves sewn in by hand so as to give the greater amount of fullness over the prominence of the front end of acromion bone,

and sewn snug down back scyes with a " tight-hand "; " scye " is the trade term for armhole.

This is not a technical treatise or it would be necessary to devote considerably more space to technical details and instruction.

Such, then, is the procedure of the very best retail trades : similar principles are always kept in view in the making of vests and of trousers.

CHAPTER VI

PRESSING

PRESSING is an important operation, although it is said that as good wine needs no bush, so good work needs no pressing.

The more carefully the work is put together, certainly the less pressing it requires.

Pressing is performed in opening the seams of the garments and pressing them so dead that they never rise again. This requires time and an iron just off the "burn." A lukewarm iron is useless, as the seams will rise again after it is removed.

In the bespoke trade each tailor does his own seam-pressing and pressing-off, and uses the tailor's "goose" varying from 12 lbs. to 24 lbs., according to the operation he is performing. Everyone is familiar with the "goose," and it needs no description.

The time it takes for the weight and heat of the hand-iron to effectively press open seams would preclude any bulk quantity of work getting through in the wholesale.

Therefore, pressing-machines are in operation, such as that illustrated in Diag. 4, Chapter V, or Diag. 1 in this chapter. Girls or boys just entering the trade are often put to work these seam-pressing machines and even an operator of 14 years of age will, by the foot lever, obtain a pressure upon the seam of about 260 lbs.

Pressing-off is the final finish to a garment, which requires special skill and attention : men employed at this work in some of the best factories have been earning 25s. per day. It is work of a heavy nature.

Pressing-off for coats consists in making the garment smooth, while maintaining the shape already given to the chest, shoulders, and collar.

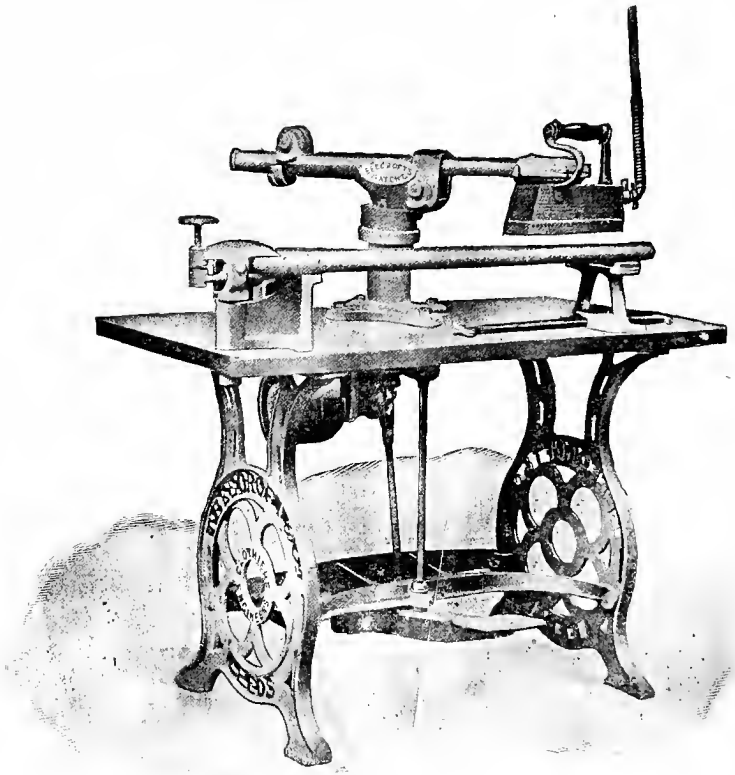


DIAGRAM 1

It is performed by placing a thin linen or cotton cloth, which has been wrung out as dry as possible in clean water, upon the garment to be pressed. The iron must

be hot, but not too hot, and the weight of the iron must be retained in the hand of the operator ; if the iron be permitted to rest its weight upon the garment, a patch of gloss will result, which will take more time to remove. The iron, therefore, is lightly smoothed over the damp-cloth so as to raise a little steam which should rapidly pass away. This is a wearisome operation if engaged in continuously and skilled men merit the highest scale of pay.

Too wet a damp cloth creates an excessive amount of steam upon the garment, which causes the fibres of the fabric to rise. In such a case it is said to be " boiled," and is one of the worst evils that can happen to a garment : it robs the fibre of life, and even when dried there is something lacking which lessens the value of the garment considerably ; it can never be restored to its pre-boiled condition. Hence pressing-off is an operation of skill and judgment.

Pressers-off in factories do not use the tailor's goose : they stand over an iron all day long, which is always heated.

The irons used are atmospheric gas-irons heated by a mixture of compressed air and gas on the blow-pipe principle.

Like most of the appliances in the clothing trade, this system of heating was first introduced to this country some years ago by the Americans.

The air is compressed by a rotary air compressor (Diag. 2), driven by a small electric motor. The air is driven through pipes to the pressing tables where it connects into a V joint, one branch leading the driven air and the other joint the gas, and thence a current of mixed air and gas is driven down a tube into a patent pressing-iron (Diag. 3).

This is very heavy work, and is not readily taken to.

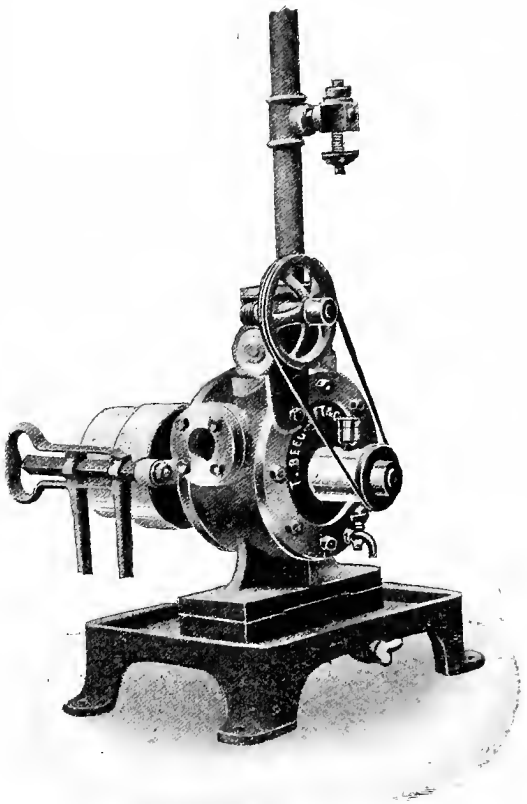


DIAGRAM 2

The supply of male labour not being equal to the demand, some firms employ women, but they have rarely the skill or the strength to continue this operation for any length of time.

Another American invention was introduced to enable female labour to be employed upon pressing-off bulk quantities of garments, illustrated in Diag. 4.

The " Hoffman " Press made in many patterns under patents by Messrs. Braithwaite & Son is now largely

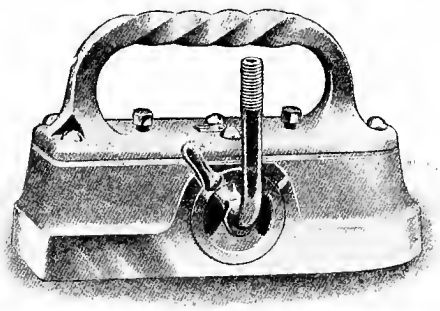


DIAGRAM 3

used in English factories. Its peculiar features lie in the fact that the top part of frame is the damp-cloth, through which by the operator touching a lever, a small quantity of superheated steam is impinged upon the garment, and the pressure between the two pressing frames is actuated by the foot lever.

The principle of this apparatus is scientifically correct and in the hands of a skilled operator is the quickest pressing plant in use. The drawback is that operators are careless and indifferent, using steam at lower

pressure than is demanded by the operation, hence tending to get the "boiled" effect already referred to.

Manufacturers should periodically give their girl operators on this plant a coaching lesson, directing their attention especially to see that the steam used is not

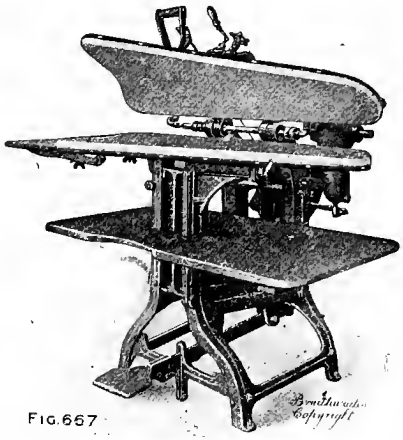


DIAGRAM 4

lower than a 60-lbs. pressure, that a bare touch only of the release lever be given, and that due care shall be given to retain the true forms of the garments pressed. Manufacturers frequently award bonuses for output; if they added a bonus for proficient work, it would raise the reputation of their productions.

CHAPTER VII

MATERIALS AND PRICES

It is important to notice distinctions in materials because materials are sorted into two classes, governed by the amount of care and time they require to be made-up.

The first class includes all worsteds, or worsted makes of botany serges, fine saxonies or angolas, vicunas, cashmeres, fine whipcords of worsted make.

The second class includes all tweeds or cloths of a tweed character, soft, open-made goods easy to handle, homespuns, flannel suitings and all similar make of materials.

The necessity of these classes arises from the fact that it requires several hours extra to make satisfactorily finished garments from Class 1 materials, and even then only the best craftsmen can turn such goods out well-tailored. Inferior workers can make from tweeds, whereas did they put their skill into a worsted coating the garment would be an eyesore and lack the evenness which should be in keeping with the character of the materials.

Frequently on mentioning the "Trimmings" used in a suit of clothes, one is met with the remark that such are only a bit of lining and a few buttons; it will be edifying to give the full cost of a suit of clothes.

Very frequently also one runs up against the popular notion that it takes $3\frac{1}{4}$ yards of material to cut a suit: quite so, for some sizes the quantity is sufficient. But sizes of individuals unfortunately vary considerably.

Here follows particulars of a suit recently made for the writer—

	£	s.	d.	
3½ yd. of worsted @ 28s. a yd.	4	18	–	
1¼ yd. alpaca lining @ 7s. a yd.		8	9	
1¼ yd. fine quality shrunk elastic duck canvas @ 2s. 8d. a yd.		3	2	
1½ yd. striped sateen @ 2s. 4d. a yd.		3	6	
½ yd. vest canvas @ 1s. 10d.			11	
1 yd. silesia for pockets, etc., @ 2s. 1d. yd.		2	1	
½ yd. soft haircloth for front shoulders @ 3s. 6d.		1	9	
½ yd. linen for stays @ 2s. 4d. a yd.		1	2	
⅝ yd. trouser pocketing @ 2s. 6d. a yd.		1	7	
Staytape for staying pocket mouths, etc.			3	
Wadding			4	
Buttonhole twist			6	
Buttons		1	8	
Raven silk sewings		1	6	
	6	5	2	
Making coat	1	4	9½	
Extras—				
Edges stitched by hand		1	10	
Second try-on		1	1	
Extra holes in cuffs			9	
Making vest		9	6	
Stitched by hand		1	1	
Vents and inside pocket		1	5½	
Making trousers		8	9	
Cash pocket with flap		1	1	
Waistbands			4½	
2 hip pockets with flaps		2	2	
	8	18	–	
Cutting and fitting		10	–	
Prime cost	9	8	–	
	4	14	–	= 50% added
Selling price	14	2	–	

That is, total gross profit on prime cost 33⅓%, made up of—

17½% business expenses (varying),
10% net profit, and
6% for discount and unknown risks.

Prices of materials are subject to market fluctuations, and wages by Trades Board rulings.

The cost of the cloth, trimmings, and the making is by no means the most expensive obtainable, but are a fair average for really genuine bespoke tailoring.

The alpaca lining may be replaced with a worsted Italian cloth or Verona ; or a plain cotton Italian very highly finished.

The shrunk duck, for which the writer has a preference, may be replaced with French canvas, flax canvas, or one of the many makes of spun hair interwoven with cotton or wool.

The materials used in the wholesale are generally inferior to the bespoke, but there are some special class factories who supply equal quality materials and who retain the services of bespoke tailors to make the garments. It all amounts to this, that the public can create a demand for anything it is prepared to pay for, but it cannot get ten-guinea articles for a couple of Treasury notes.

The prices paid for making in the wholesale differ absolutely ; a fair average of present prices is—

	s.	*d.*	
Men's lounge coats	4	9	
Vests	1	7	
Trousers	1	8	
Cost of suit making . . .	8	–	
(Of course the overhead charges in a factory are greatly in excess of a tailor's workshop.)			
Factory overhead costs average about 80%, say	6	6	
Total cost of making . .	14	6	per suit

An idea of the closeness in working out factory rates for work in various operations, may be gathered from the

following prices actually paid to operators at the present time—

Boys' Juvenile Jackets.	*Per dozen Jackets.* s.	d.
Making throughout in machine stage	8	–
Sleeving		10
Finishing, including bar-tacking holes	6	–
Machine buttonholes		6
Pressing-off	1	6
Total wages paid for making	16	10

A quick machinist would probably turn out four dozen of such jackets in a week of 48 hours. Of course it has to be borne in mind that factory machines are all power-driven and stitch at a terrific rate compared with a treadle machine.

This means skill, stickability, and energy ; but human machinery breaks down sooner or later under this continual drive, or else become anaemic apologies for womanhood, and that is one of the most urgent reasons, in the writer's judgment, for the establishment of a standard subdivisional system whereby the same output is maintained without exhausting the workers.

It will be thought amazing, it has often been so considered by those ignorant of internal conditions, that if the wages paid for making a man's suit in a factory be 8s., the tailor who is paid £2 3s. 9d. for making a man's suit must own a gold mine.

It must be understood that the work done in factory making-up, at the prices instanced, is done by female labour. The writer holds no brief for this scale of existence. To get a living at the prices is a repetition of Tom Hood's "Song of the Shirt," only under modern conditions, in "a land fit for heroes to live in."

The writer has as varied and as wide an experience

in this and other countries as anyone connected with the clothing trades. He does not hesitate, therefore, to make the following assertions, that the average skilled journeyman tailor averages just under three coats per week. On the top of that, the trade being susceptible to season's changes, there are some months when he does not average half of that ; that in spite of the fact of being a skilled artisan, he does not average the year round the wages of a road-sweeper—take it on the computation of present-day rates or pre-war.

It is true that here and there one comes across a " swift " coat-maker who may make four a week of 50 hours, and one man the writer had in the whole of 25 years' experience, who made five coats per week which so exhausted him that every now and again he had to go on the " bust " for a fortnight to ease the strain.

The average trouser-maker will make from five to six pairs per week of 48 to 50 hours. A few here and there will exceed that, some few now and then by a spurt turning out eight to nine pairs.

But the fact remains and cannot be controverted that the rush for output deteriorates the finished article : the " swift " man is a useful worker to have when some of the public imagine a tailor is a penny-in-the-slot-machine, but the best coat-makers all over the world average two and a half coats per week. If the price paid for their work and time is too much, then reduce the work.

Good work in whatever calling is the result of years of accrued skill and acquired talent. It is absurd to appraise the value of a lifetime's skill on the basis of ability shown by the lad just out of his apprenticeship and now commencing the uphill road to skill and excellence.

It is also absurd to attempt to appraise the value of work which lies outside of one's own actual experience.

Toleration is the keynote of peace on earth, and it may be taken for granted that, in the economic evolution of men and their affairs, the value of labour will find its own level.

The day has gone when the remuneration demanded and accorded one trade was at the expense and by the exploitation of other trades. It is now recognized that skilled labour is interchangeable in value : that skilled labour in whatever calling shall merit a standard minimum rate, with increase for special skill and ability.

INDEX

APPENDIX

THE FIRE HAZARDS OF CLOTHING FACTORIES

By E. I. Lister, A.C.I.I.

In almost all trades, improved methods of manufacture and production are being constantly introduced. In many places new factories are in course of erection, and existing premises are being altered or extended. Serious fires have occurred from time immemorial. Notwithstanding modern development, fire waste still continues —at times to an alarming extent. To many of those whose business it is to consider and assess the fire risks of our industries and to suggest means of their elimination or minimization, it is, alas, only too apparent that rarely is sufficient attention given to the subject. Clothing factories, as a class, lend themselves admirably to the reduction of fire hazard to a minimum, always assuming that in the initial stages this very important matter is not overlooked.

It is impossible to eliminate entirely the risk of fire. It is always present in some form or another, whether in the humble cottage or in the large, and often congested, manufacturing premises. In considering the fire hazards of any particular industry, attention is first focused on the raw materials involved and the methods employed in their manipulation. The raw materials *per se* often present varying degrees of hazard in different stages of production, as for example, a more or less non-hazardous substance or material may become hazardous, and vice versa.

There are what may be termed Common Hazards in all trades ; these include, *inter alia*, construction, height,

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and cubical capacity of buildings, method of lighting and heating, etc., etc. This type of hazard is more or less inevitable in all industrial risks. It so happens, however, that these common hazards are a very variable quantity. In some cases it is found they occur in many forms or to a greater individual extent in the same class of risk.

Generally speaking, clothing factories do not present the complicated hazards referred to earlier, as the majority of the attendant risks fall within the class referred to as common hazards. Of course there are the special features peculiar to the clothing industry.

Except in regard to waterproof garment factories, which are dealt with hereafter, the materials used—chiefly consisting of cloth of varying textures and qualities—do not of themselves present any serious hazard. In passing, however, mention may be made of cotton wadding which is used in the making-up for " padding " purposes. Cloth would of course act as quite good " fuel " to a fire once started, and in addition is very susceptible to both smoke and water damage. It will therefore be appreciated that considerable damage may be done, even though the goods have not been touched by fire.

The machinery employed is of a light nature—no heavy or high-speed machines, involving the use of high motive power and heavy shafting. The consequent risk of friction and overheated bearings and motors, coupled with the necessity for large (and often dirty) rope and belt drives through the floors, is therefore considerably minimized. In most cases electrical power is used, the various machines on the different floors being divided into units and driven by separate motors. In some factories, however, the whole plant is driven from one power unit—usually a steam or gas engine or,

perhaps, where gas is not available, maybe an oil engine ; in these cases where it is necessary to take the rope or belt drives through floors, the openings in the latter should be restricted as much as possible and the partitioned-off compartments usually found round the drives, kept clear of dirt and other waste and greasy accumulations. In single-story factories (or shed factories, as they are often referred to), underground drives are not unknown. Here the shafting is sunk in compartments below the shed floor and, as in the case of drives through storied buildings, cleanliness should be maintained. Lubrication should be in responsible hands and automatic as far as practicable.

Methods of heating are a very important feature in clothing factories, i.e. heat both for warming the building and that necessary for trade processes. So far as the heat required for maintaining the temperature in the rooms is concerned, the most satisfactory method is central heating by either low pressure steam (i.e. steam entering the system at a temperature not exceeding 350° F.), or low pressure hot water. Steam at a higher temperature than 350° F. and high pressure hot water apparatuses are not very desirable, as there is in clothing factories considerably more than the usual amount of wooden floors, partitions, and linings, and sufficient care is rarely exercised to see that the pipes and radiators are kept clear of these combustible materials. In many of the smaller factories, central heating is not available, when usually gas and electric stoves and/or radiators and slow combustion stoves are resorted to. There is no doubt that slow combustion stoves (or pipe stoves) present an undesirable feature in clothing factories, more particularly the type with long smoke pipes. In fact, the smoke pipe, assuming the stove itself is otherwise satisfactorily arranged, is undoubtedly the

chief source of danger. It very often happens that these pipe stoves are met with in small congested factories—several tenants occupying portions of the same building—and although the insurance companies have done a great deal towards exterminating the hazard by the imposition of heavier premiums, it is not an uncommon sight to-day to see smoke pipes over 20 ft. in length, in such premises. If, however, the pipe stove is arranged in a deep tray of liberal dimensions, standing on an incombustible base with the smoke pipe venting direct into a brick chimney or through a brick wall, the hazard is considerably reduced.

Now a word in regard to the heat required in the process of manufacture. There is, of course, no system of drying involved in a clothing factory. The risk lies in the multiplicity of small units necessary for pressing and ironing. It would be impossible in an article of this nature to describe all the various systems employed in heating irons, and detail the fire hazards individually. Modern methods are certainly far superior from the fire risk point of view, in addition to their higher efficiency from the commercial standpoint. Some years ago, when loose irons were invariably employed, it was quite common to find several gas or fire-heated ovens for them in one factory. This mode of heating is still occasionally used. Naturally, these ovens or stoves for heating irons are well "fired," and are kept at a greater temperature than the ordinary stoves used for warming the building. Care should be taken to see that there is no combustible material in the immediate vicinity and that the oven or stove stands on flags or concrete, with a clear space of approximately 6 in. between the base of the oven and the flags or concrete, or alternatively, 12 in. between the flags or concrete and any wooden floor. Then there are the small gas rings or circles for heating an odd iron,

or maybe a small gas stove capable of heating two or three irons. These should all be placed on a base of stone or concrete and connected only by pipes of iron—rubber tubing should be avoided for these small fixed stoves. To-day, the most popular method, and apparently the most successful, is to use box irons, heated by gas or electricity—generally the former. The irons are heated usually by a mixture of gas and compressed air, on the blowpipe system. The mixture is conveyed to the pressing tables in iron pipes, from whence it is delivered to the irons through stout rubber tubing, which is generally protected by a wire spiral near the iron. Stands or incombustible bases should be provided for these irons, which together with electrically heated irons do not present any special feature of risk except perhaps from the carelessness standpoint—irons with the heat still connected being left on wood benches or on the top of garments, etc. Steam-heated presses are also frequently used, the steam being supplied from a central steam boiler or, as occasionally happens, when such is not available, from a small gas-heated boiler alongside the press. The apparatus should be fixed clear of combustible material. No doubt there is a slight risk of explosion on account of the steam pressure required —approximately 80 lb. to the square inch—and it is advisable for the various presses to be periodically inspected.

It will be seen from the above remarks that the heating required for trade processes certainly presents quite a special feature in clothing factories. It is not so much the risk attached to a box iron, or a gas ring, but the accumulated risk of large numbers in use in various parts.

It is perhaps unnecessary to refer specifically to artificial lighting, as coal gas or electric light is now almost

universally available—at any rate, where a clothing factory is likely to be found—but in passing it may be mentioned that in crowded stock rooms where coal gas is the illuminant, wire guards should be provided round the naked lights for obvious reasons.

In many types of manufacture it is necessary to erect mills and factories specially, perhaps not only for the physical or structural features, but possibly also for various reasons in regard to locality and situation. In certain other classes of manufacture, existing buildings can be adapted with varying degrees of difficulty and expense. Now, turning to clothing factories, it can safely be said that, assuming suitable labour is available, "any old place will do." It does not demand the exercise of a great deal of ingenuity or ability to turn almost any type of building into a factory for the wholesale manufacture of clothing. In fact, the writer has come across these factories of varying sizes in most unexpected quarters, and buildings converted to their use ranging from stables to iron foundries. Now it may be asked what particular bearing all this may have on the fire hazard? In practice it presents quite an important feature. Except in regard to the large self-contained factories, this special feature of what might be termed "easy adaptability" affects very large numbers of the smaller type of factories, which will no doubt form no small part of the aggregate. It will therefore readily be appreciated that in one building there may be several tenants, all possibly clothing manufacturers, and each one presenting his own special (and cumulative) hazard. Sight must not be lost of the important bearing this question of plural tenure has on the fire risk. Most careful supervision and attention to questions of fire hazard may be given by three of the tenants, but the fourth may disregard such matters and through his lack

of management, untidiness, carelessness—or whatever it may be described—the whole building may be destroyed. It also frequently happens that owing to this same "easy adaptability," clothing factories are found in buildings which are otherwise in the occupation of tenants carrying on all manner of trades.

There is little doubt that the most suitable building for clothing manufacture is one of a single story only. From the constructional point of view this type of factory is obviously the least hazardous, and more particularly so if there is no basement under any portion. Owing to the scarcity and value of land, very few shed factories are found near the centre of towns, indeed, the opposite is the case. The majority of the factories are situated near the centre of the towns where room for extension is limited, with the result that many of our large clothing factories, including those owned and occupied by one firm, consist of large buildings ranging from four to six and seven stories in height. Owing to the necessity for good light, the external walls frequently appear almost to consist entirely of windows, and in addition lighting wells are occasionally found through the floors. There is therefore quite a serious exposure hazard in this type of storied factory which is considerably enhanced in congested city areas. Owing to the height, the danger of a fire spreading rapidly is always present, and this feature is accentuated if, in addition, there are non-fireproof openings through the floors, such as timber staircases, hoists, lighting wells, and belt races.

Another important feature, often encountered in clothing factories, is the presence of a good deal of wood linings to walls and ceilings, and wooden partitioning dividing the various departments. Although these do not present any serious hazard *per se*, they all lend to

fiercer conflagration and more rapid spread of fire—more especially if the wood linings are not laid flat against walls or ceilings or if partitions are not restricted in height.

Steam boilers and their firing places, gas and oil engines and power gas producing apparatus are unsatisfactory features inside clothing factories, particularly those of several stories; they are much better when situate in a separate building, bricked off from the main factory.

Another feature which cannot be overlooked is what may be termed the "accumulation" hazard. In other words, the concentration of huge values in one building or block of buildings in open communication, which are all liable to destruction by a single outbreak of fire. This is a risk which can be considerably minimized by the judicious division of the premises. This can be accomplished in several ways. The best method, which, however, is frequently impossible on account of lack of space, is to erect several detached buildings without windows or doors facing or in close proximity to those in another block. Where detached buildings are impracticable, then perfect party walls and fireproof doors, and also fireproof floors, may be used to advantage.

The general management of a clothing factory is of fundamental importance from the fire hazard standpoint. It is complicated where several factories in separate tenure are contained in one and the same building. Lax management may occur in many directions and of course is reflected from heads, down to the humblest employees. Without going into detail, and considering such matters as the non-suppression of surreptitious smoking, etc., it will suffice to mention what is no doubt the most important feature under this heading. This is the disposal of trade refuse. The latter

primarily consists of cloth clippings, no small amount being made from cotton linings and cotton wadding. It will be appreciated that if these clippings are not swept up regularly from the floors, they undoubtedly create a serious addition to the fire risk. Even if swept up and stored indefinitely in fairly large quantities in a separate room in the factory, the risk is not eliminated. The only satisfactory method is to dispose of all clippings every few days, or store the same in some small detached building. Dirty oily wipes which have been used for cleaning machinery should never be left in the factory overnight ; so far as these are concerned there is the additional risk of spontaneous combustion.

Having dealt with the fire hazards of the usual clothing factory, the subject is not complete without a reference to the additional hazards which are to be found in waterproof garment factories. The term " waterproof garments " is intended to refer to those produced from cloth which has been lined with rubber, similar to the ordinary mackintosh.

The additional hazards may be placed in two categories, (1) the nature of the stock, and (2) the use of rubber solution for cementing together the various parts of the garments.

Owing to the rubber lining, the stock is considerably more inflammable than the cloth handled in the ordinary factories, in addition to the fact that the greater percentage of the cloth itself is manufactured from vegetable fibres—cotton, etc.

Rubber solution is produced by dissolving unvulcanized rubber in a solvent—usually naphtha. The latter is a volatile spirit with a flash point in the region of 60° F. Evaporation therefore will quickly take place, and when the vapour is mixed with air, an explosive mixture may be formed which, owing to the low flash

point, can easily be fired. Naphtha vapour, too, being heavier than air, would tend to fill up all sunk spaces and lurk about under benches, etc.

It will therefore be appreciated that the greatest care should be taken both in the method of storage and handling of the rubber solution ("dough," as it is usually termed) and the naphtha.

In some of the larger factories, the rubber solution is made on the premises. In these cases, the process should be carried on in a small building, used solely for the purpose, well ventilated and detached as far as possible from the factory proper. In the majority of cases, however, the solution is purchased ready prepared. Each operative is supplied with a small open-topped metal container from which the "dough" is smeared by the finger on the joint to be cemented. These small containers should be fitted with a tight fitting lid—an automatic self-closing device would be more advisable, but it has been found in practice that these are unworkable owing to the sticky nature of the solution and the tendency to retard the work of the operatives. In one or two cases, in the factory, the worker will require a small quantity of naphtha, and this should only be kept in a metal vessel fitted with an airtight lid.

The main stock of rubber solution from which the operatives are supplied should be kept in metal cans fitted with lids and contained in a metal cupboard or chest, as also any naphtha used for thinning down when necessary. Large stocks should, however, never be stored inside the building—only what is absolutely necessary for the smooth running of the factory. When work is finished for the day, each operative should empty his can of solution and/or naphtha into the stock tin. This latter precaution, however, is not entirely satisfactory, as a quantity of solution will always

adhere to the sides and gradually evaporate through the night.

It is imperative, therefore, that in these rubber garment factories, ventilation should be adequate, and particular attention should be paid to the method of lighting, heating, and removal of clippings—all features referred to earlier in the remarks on ordinary clothing factories. Everything in the form of naked lighting and heating should, of course, be avoided.

Attention, too, might be drawn again to the question of the accumulation of fire hazard already referred to, which in the waterproof garment factory, it will readily be appreciated, is even much more important than in the ordinary clothing factory.

One-story buildings of moderate capacity are much to be preferred.

Excluding, perhaps, waterproof garment factories, it can safely be stated that clothing factories on the average do not present any very special feature of inherent hazard, as is found in some trades. It must not be overlooked, however, that once a fire has commenced, if not checked in its incipient stages, it will invariably result in very heavy damage. These latter remarks refer more especially to storied buildings with wooden floors, well holes, hoists, etc.

In conclusion, it may be of some use to outline very briefly what is considered an ideal factory from the fire hazard point of view. This would consist of a single tenancy, one-story building, with floor and walls of brick, stone or concrete, and roofed with slates or some other incombustible material such as iron or asbestos, the roof lights being preferably of wired glass in metal framework; no wood partitions or linings, except perhaps where close boarding is required for slates. Lighting would be by electricity, and electro-motors

used for power, current for both produced externally. Low pressure hot water or steam would be the method employed for heating, with the furnace or boiler fixed outside in a separate building. The irons would be of the box type or heated by gas (or electric) rings or stoves fixed as previously described. Clippings and other trade refuse would be swept up daily and regularly removed. Finally, the size of the factory would be restricted to the accommodation of not more than 150-200 operatives.

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