May 3, 1949. H. GARYAIT 2,468,927

ART OF MANUFACTURING SHOE COUNTERS

Filed Aug. 3, 1946

5 Sheets-Sheet 1

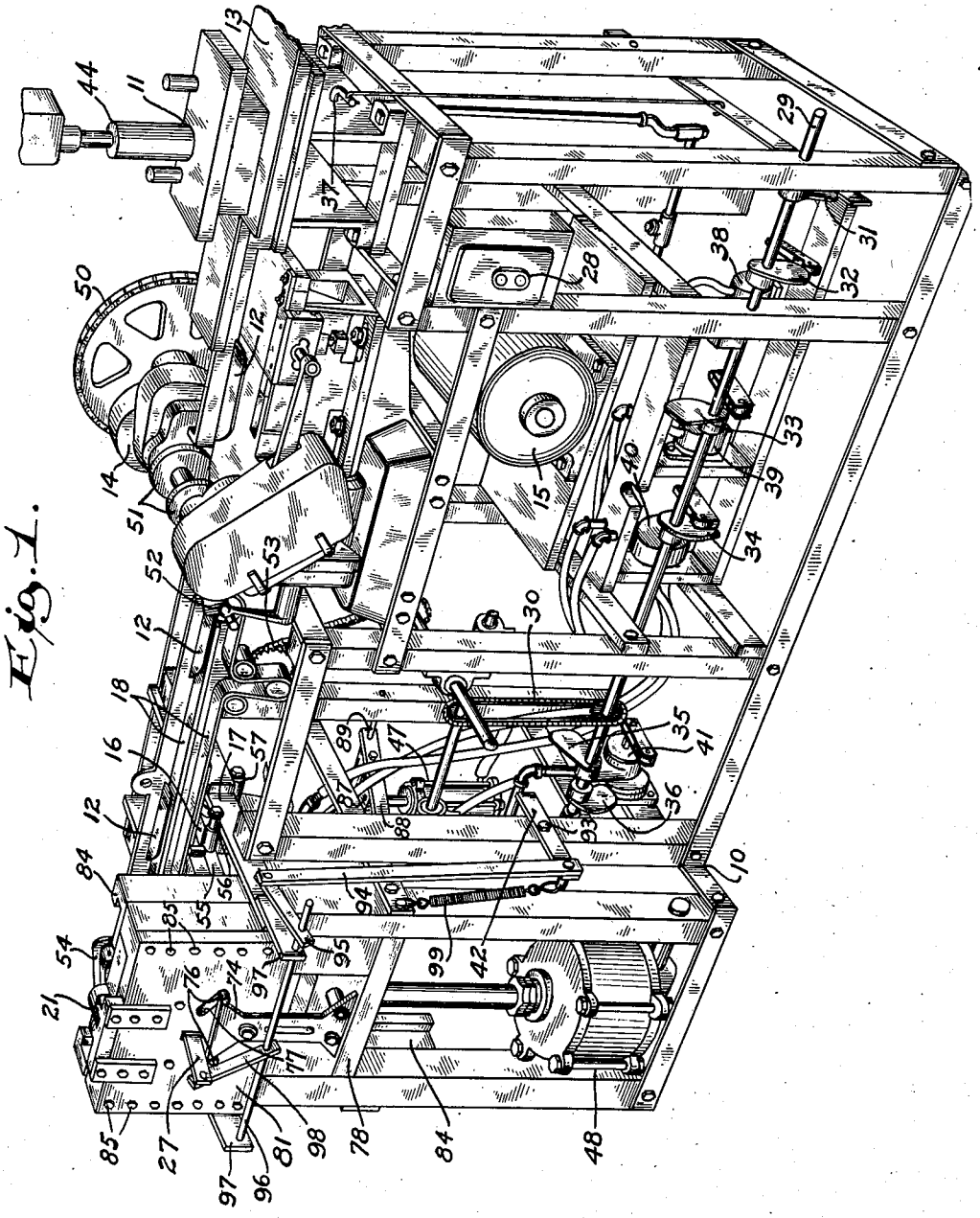


Fig. 1.

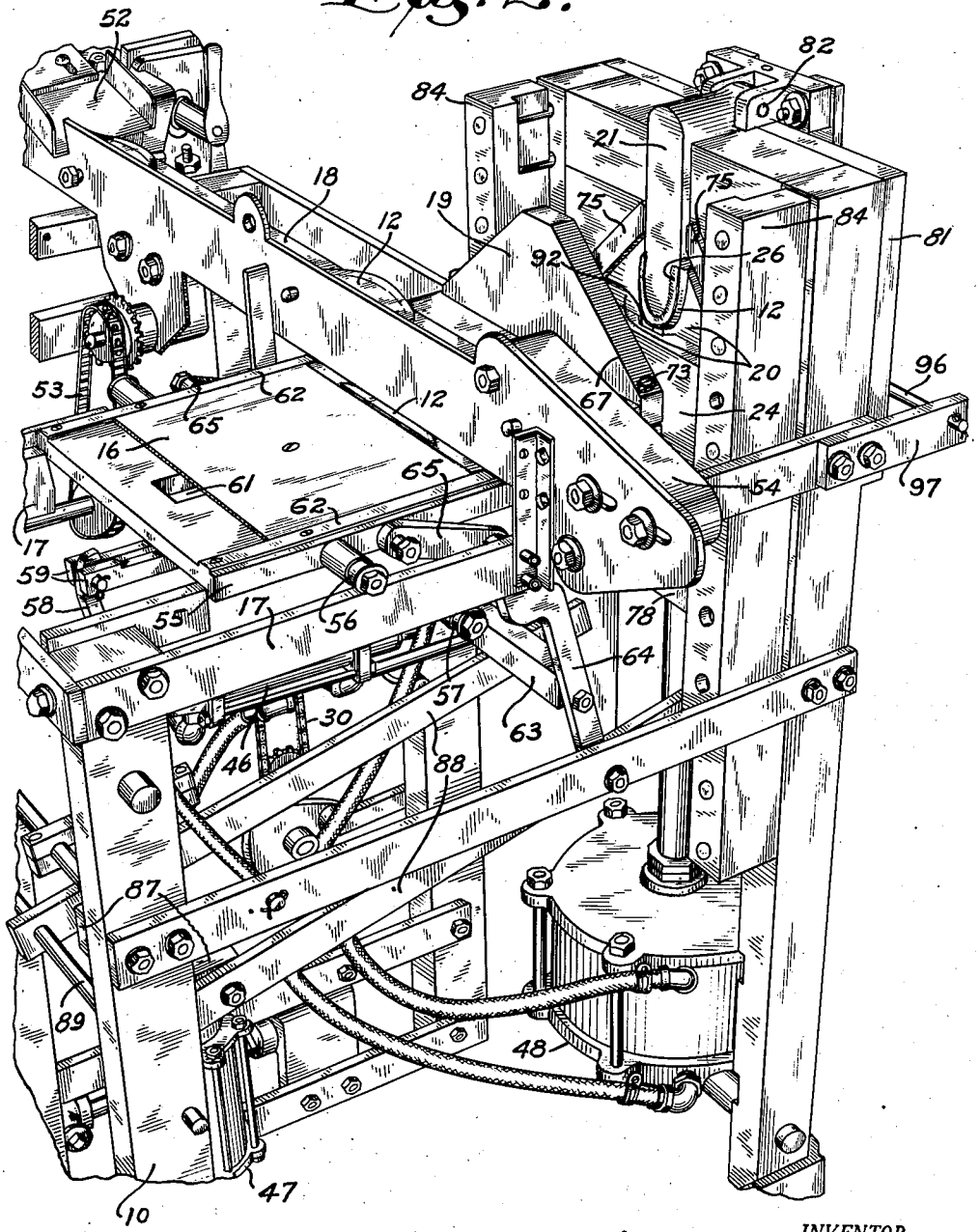
INVENTOR.
Henry Garyait
BY
Lieber & Lieber
ATTORNEYS.

May 3, 1949. H. GARYAIT 2,468,927

ART OF MANUFACTURING SHOE COUNTERS

Filed Aug. 3, 1946 5 Sheets-Sheet 2

Fig. 2.



INVENTOR.
Henry Garyait
BY
Lieber & Lieber
ATTORNEYS.

May 3, 1949. H. GARYAIT 2,468,927

ART OF MANUFACTURING SHOE COUNTERS

Filed Aug. 3, 1946 5 Sheets-Sheet 3

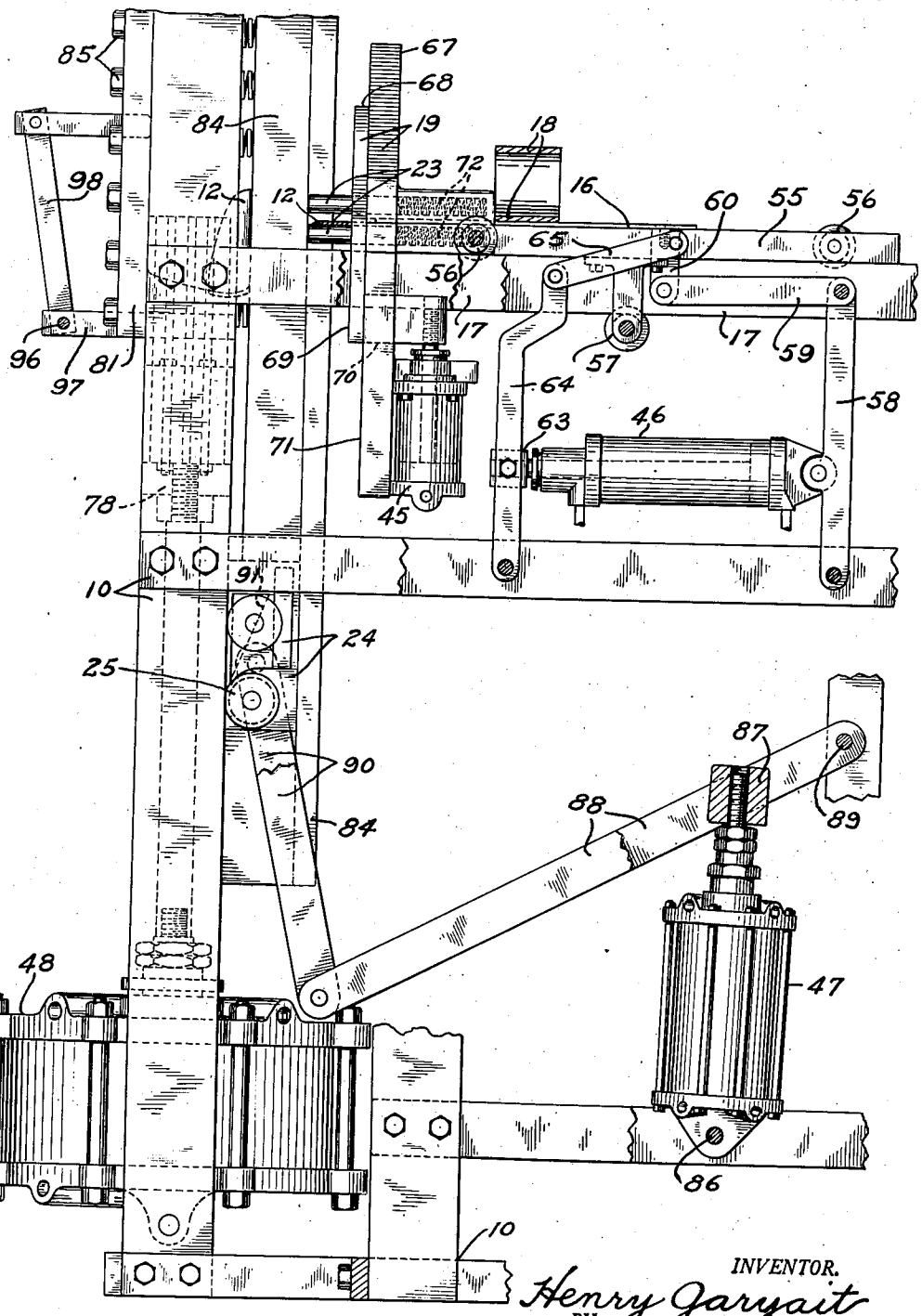


Fig. 3.

INVENTOR.
Henry Garyait
BY
Lieber & Lieber
ATTORNEYS.

May 3, 1949. H. GARYAIT 2,468,927

ART OF MANUFACTURING SHOE COUNTERS

Filed Aug. 3, 1946 5 Sheets-Sheet 4

Fig. 6.

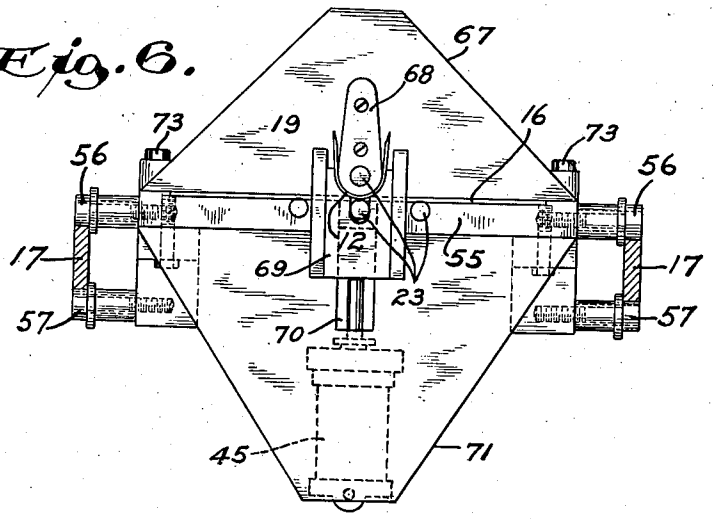
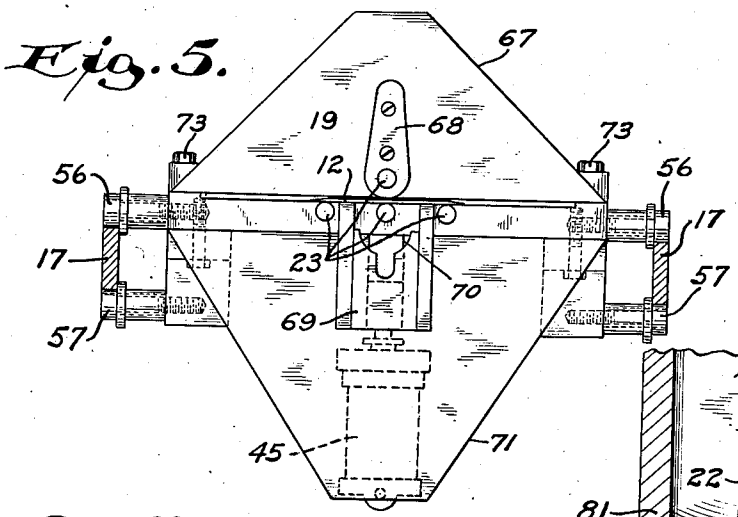


Fig. 5.



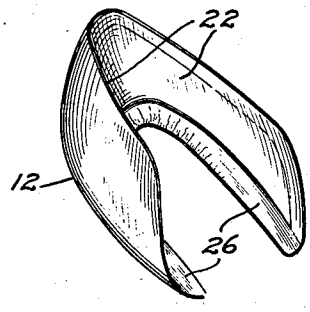


Fig. 8.

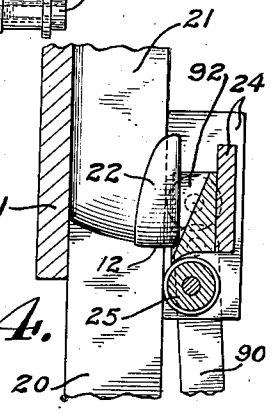


Fig. 4.

INVENTOR.
Henry Garyait
BY
Lieber & Lieber
ATTORNEYS.

May 3, 1949. H. GARYAIT 2,468,927

ART OF MANUFACTURING SHOE COUNTERS

Filed Aug. 3, 1946 5 Sheets-Sheet 5

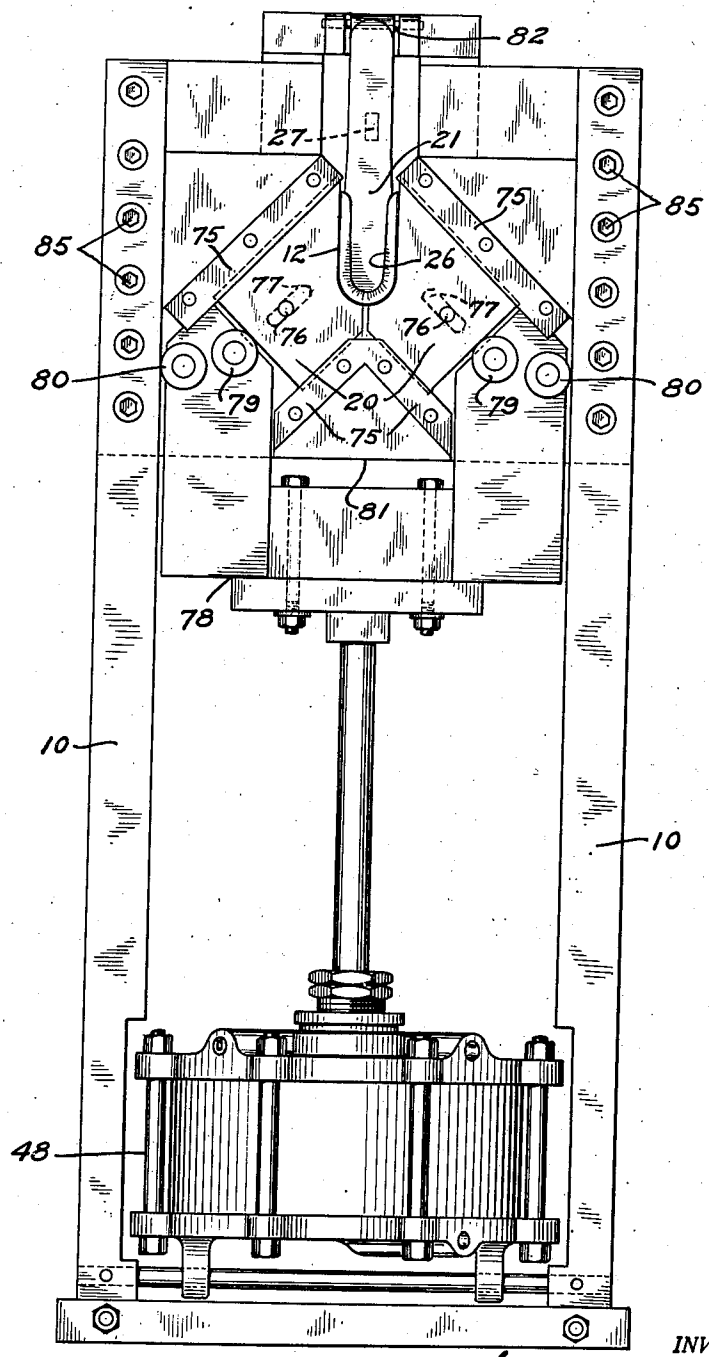


Fig. 7.

INVENTOR.
Henry Garyait
BY
Lieber & Lieber
ATTORNEYS.

Patented May 3, 1949

2,468,927

UNITED STATES PATENT OFFICE

2,468,927

ART OF MANUFACTURING SHOE COUNTERS

Henry Garyait, Milwaukee, Wis., assignor, by mesne assignments, to Van Horne Kaestner Leather Co., Milwaukee, Wis., a corporation of Wisconsin

Application August 3, 1946, Serial No. 688,217

10 Claims. (Cl. 12—66)

1

The present invention relates generally to improvements in the art of shoe making, and relates more particularly to improvements in the more specific art of manufacturing counters for shoes and other footwear.

The primary object of my invention is to provide a new and useful method of and apparatus for automatically and effectively producing shoe counters or the like, in rapid succession.

The speedy and efficient production of counters from composition or leather and at minimum cost, has heretofore confronted shoe manufacturers with numerous apparently unsurmountable difficulties. It has been customary in the past, to punch groups of the counter blanks from a stack of sheets, and to thereafter subject the blanks in succession to a series of manual and automatic operations, some of which were relatively slow and tedious, and others of which while being accomplished automatically were relatively ineffective, and all of which cooperated to prevent rapid and efficient final counter production.

With the prior methods after the counter blanks had been tempered and were subsequently skived along their edges, they were individually manually bent into generally U-shape before they were inserted in succession in the forming presses. This manual bending operation was so slow that it materially retarded quantity production; and it was also prior uniform practice to heat the counters while in the final forming presses and during application of the inturned flanges to the lower skived edges thereof. It has been found that this heating when applied to composition counters having thin skived edges, produced many defective counters and would frequently cause the flanges and thin edges to break and tear while the finished counters were being applied to the shoes, thus causing further delay in the manufacture of shoes and often resulting in defective final footwear. Then too, the final presses heretofore employed in the shoe counter manufacturing industry, were provided with pressing jaws operated by complicated toggle mechanisms which functioned in a relatively ineffective manner and did not produce entirely satisfactory results; and the various difficulties were also enhanced when longer and wider counters came into vogue. Because of all of these difficulties, it was impossible with the prior semi-automatic methods of manufacturing counters, to raise the production speed above twenty counters per minute on any one manufacturing line, and this could only be accomplished by a skilled operator working under extreme pressure.

2

It is therefore a more specific object of the present invention to provide an improved mode of manufacturing shoe counters whereby all of the above mentioned difficulties and objections are eliminated.

Another specific object of this invention is to provide an efficient and dependable method of automatically producing a succession of perfect shoe counters at high speed and with minimum manual effort or handling.

A further specific object of my invention is to provide an improved method of treating and distorting composition counter blanks of diverse sizes and shapes so that uniform and perfect counters may be produced in rapid succession, without necessity of applying artifical heat during final pressing of the blanks and formation of the flanges.

Still another specific object of the invention is to provide improved apparatus for effecting commercial exploitation of my new method of counter production.

A further specific object of my invention is to provide provide improved instrumentalities for initially bending the successive counter blanks into U-shape, for applying the initially bent blanks to pressing mechanism, and for finally properly shaping the counters without undesirably weakening the structures.

An additional specific object of this invention is to provide an improved shoe counter production system whereby counters of various styles may be rapidly produced at minimum cost and in a most efficient manner.

These and other specific objects and advantages of the invention will be apparent from the following detailed description.

A clear conception of the several steps involved in my new mode of manufacturing counters and of the general construction and operation of apparatus for automatically exploiting the method, may be had by referring to the drawings accompanying and forming a part of this specification wherein like reference characters designate the same or similar parts in the various views.

Fig. 1 is a perspective view of a typical shoe counter producing machine embodying my invention and adapted to commercially exploit my new method of manufacturing counters;

Fig. 2 is a somewhat enlarged perspective view of a portion of the same commercial machine, looking in a direction opposite to the view point of Fig. 1;

Fig. 3 is a further enlarged part sectional side elevation of the improved mechanism for producing the successive counters in rapid succession from the flat blanks, showing the final counter flanging and ironing device in inactive position;

Fig. 4 is a similarly enlarged fragmentary section taken through the mechanism of Fig. 3 and showing the final flanger and flange ironer in action;

Fig. 5 is a likewise enlarged end view of the mechanism for initially bending the successive flat blanks into U-shape, showing the forming elements retracted, and a flat counter blank being positioned therebetween;

Fig. 6 is a view similar to that of Fig. 5, but showing the U-shape initial forming elements in action;

Fig. 7 is a similarly enlarged end view of the final counter forming mechanism, but having the final flanging and ironing device omitted; and

Fig. 8 is a further enlarged perspective view of a finally formed counter produced by the present improved method.

While the structural improvements have been illustrated as having been embodied in a commercial electric motor driven and fluid pressure actuated mechanism adapted to automatically exploit the new method of shoe counter production, it is not my desire or intention to unnecessarily restrict the scope or utility of the invention by virtue of this limited disclosure, since other specific mechanisms involving similar principles of operation may obviously be employed by those skilled in the art in order to carry on the improved counter production method involved in my invention.

In accordance with my improved method of shoe counter production, each of the successive flat blanks after having been properly die-cut and skived, is initially bent into U-shape, whereupon the upper major portion of the blank is pressed or molded into final heel fitting form, after which the lower edge is distorted inwardly and ironed to provide a permanent bottom flange. All of these steps are performed while the blanks are cold, that is, without the application of any artifical heat, and the improved mechanism shown in the drawings is adapted to carry-on this improved method both rapidly and automatically so as to produce successive perfect shoe counters at minimum cost.

Referring to the drawings, the improved commercial shoe counter manufacturing machine shown therein, comprises in general a composite main frame **10** providing a support for the various counter producing elements and mechanisms; a die assemblage of well known construction **11** carried by the frame **10** and being operable to cut successive flat counter blanks **12** from sheet stock **13** fed rapidly through the assemblage; a blank skiver **14** also of well known construction mounted upon the frame **10** and being driven by an electric motor **15** to skive the peripheral edges of the successive blanks delivered thereto from the cutting assemblage **11** in the usual manner; a laterally movable transfer plate **16** slidably mounted upon a carrier which is shiftable along rails **17** mounted upon the frame **10** remote from the skiver **14**; a motor driven endless belt conveyor **18** for delivering the successive skived blanks **12** from the skiver **14** and for dipositing them in inverted position upon the transfer plate carrier in advance of the plate **16**; an initial fluid pressure actuated bender or pre-former **19** movable with the transfer plate carrier and being cooperable with the inverted

blanks **12** deposited upon spaced pins **23** which are also movable with the carrier, to preliminarily bend the successive blanks **12** fed forward by the plate **16** into U-shape; a set of fluid pressure actuated final molding dies **20** cooperating with a pivotally suspended molding plug **21** to finally form the upper walls **22** of the successive counters and to subsequently firmly hold the molded blanks **12**; a fluid pressure actuated flanging slide **24** cooperating with a roller **25** to wipe and iron the lower counter flanges **26** upon the blanks **12** while they are being held firmly between the dies **20** and the plug **21**, and to thereby completely form the successive counters; and a fluid pressure actuated ejector **27** cooperable with the outwardly swingable plug **21** to rapidly deliver the completed counters from the machine.

As shown the main frame **10** is sturdily constructed of structural steel, and the die assembly **11** and skiver **14** are mounted upon the upper forward portion of this frame, while the counter forming elements are mounted upon the rear frame portion and the electric driving motor **15** is supported within the frame **10** as illustrated in Fig. 1. The operation of the motor **15** is controlled by a switch **28** also mounted upon the front portion of the frame **10**, and a cam shaft **29** is journalled for rotation by the motor **15** through an ordinary chain drive **30**, in bearings carried in the lower frame portion, and extends throughout the major length of the frame. The cam shaft **29** carries a series of six revolving cams **31, 32, 33, 34, 35, 36** the first five of which are properly timed to actuate corresponding fluid pressure supply valves **37, 38, 39, 40, 41**, and the sixth cam **36** of which coacts with the ejector **27** through a lever **42** at predetermined times and for a predetermined duration; and these valves are adapted to control the delivery of fluid such as liquid or air under pressure from any suitable source of supply to power cylinder **44, 45, 46, 47, 48** so as to actuate the die assembly **11**, the counter pre-former **19**, the transfer plate **16** and its carrier flanging slide **24**, and the ironing rollers **25**, and the final molding dies **20**, respectively. This fluid under pressure may be conducted to the several power cylinders **44, 45, 46, 47, 48** through piping and flexible conduits as shown in Figs. 1 and 2, and the spent fluid may be exhausted into a receiving tank or the atmosphere in a well known manner.

The die assemblage **11** which is operable by the power cylinder **44** and the actuation of which is controlled by the motor driven cam **31**, may be of any desired well known construction adapted to rapidly punch successive flat counter blanks **12** from strips **13** of fibre or leather, and these blanks may be transferred in any suitable manner and in succession to the skiver **14**. The skiver **14** which is driven by the motor **15** through a chain drive **50**, is of well known construction and has cutting elements **51** adapted to skive or chamfer the peripheral edges of the successive blanks passing longitudinally past the cutters and is also adapted to rapidly deliver the flat blanks **12** onto the endless conveyor belt **18** over an inclined chute **52**. The endless belt conveyor **18** is also driven by the electric motor **15** through a chain drive **53** in a well known manner and is adapted to quickly advance the flat skived blanks **12** in succession toward the forming mechanism and coacts at its extreme end bend with an auxiliary belt **54** embracing this end bend to invert and to deposit these blanks in inverted flat con-

dition onto the plate carrier in advance of the transversely movable feed plate 16. The die assemblage 11, skiver 14, conveyor 18, and the manner in which these elements are normally driven, as well as their normal mode of use, are all well known to those familiar with the art of shoe counter manufacture, and their details of construction are subject to wide variation of design.

As illustrated in Figs. 2 and 3, the laterally movable fluid pressure actuated blank transfer plate 16 is slidably supported upon a supporting carrier or carriage 55 having upper and lower supporting and retaining rollers or wheels 56, 57 respectively which coact with the plate guiding rails 17. The plate 16 is connected to the cylindrical casing of the fluid pressure actuated power cylinder 46, by means of a lever 58, a pair of links 59, and a lug 60, and the lug 60 is slidable in a central slot 61 formed in the carriage 55 while the opposite side edges of the plate 16 coacts with guides 62 secured to the carriage. The opposite sides of the carriage 55 are likewise connected to the piston rod of the power cylinder 46 by means of a cross-head 63, a pair of levers 64, and links 65; and when fluid under pressure is applied to the displacement chamber at the right of the servo-motor piston as viewed in Fig. 3, the plate 16 will be moved toward the right and the carriage 55 will be simultaneously moved toward the left, whereas subsequent admission of fluid under pressure to the other displacement chamber will move the plate 16 and carriage 55 in the opposite directions.

The pre-former 19 and the pins 23 which are associated therewith, as well as the power cylinder 45, are all mounted upon and are movable along the rails 17 with the carriage 55, as clearly shown in Figs. 2, 3, 5 and 6. This pre-former 19 comprises an upper backing plate 67 having a shaping plug 68 secured to the front face thereof and pierced by the upper pin 23; and a lower saddle die 69 movable upwardly along a guide slot 70 formed in a lower backing and power cylinder suspension plate 71, by the power occurrence 45, and being cooperable with the blanks resting upon the three lower flat blank supporting pins 23 and with the plug 68 to initially bend each of the successive blanks 12 into U-shape when these blanks have been positioned upon the lower pins 23 by the feed plate 16. The three lower pins 23 thus provide a temporary support for the successive flat blanks 12 as illustrated in Fig. 5, and the saddle die 69 is operable by the power piston to lift each counter blank away from these pins and to wrap the blank around the plug 68 as depicted in Fig. 6. The lower pins 23 must therefore be located with their uppermost portions in horizontal alinement with the upper surface of the carriage 55, and all of the pins 23 are retractable against coil springs 72 located in guide sockets formed in the plate 67 and carriage 55 when the carriage moves forwardly to eject the U-shaped blanks 12. The plates 67, 71 are firmly secured to the forward end of the carriage 55 by bolt 73 shown in Figs. 5 and 6, and the power cylinder 45 is firmly attached to the rear of the lower plate 71.

The final fluid pressure actuated counter molding and flanging mechanisms are located at the rear of the unit adjacent to the pre-former, and are clearly shown in Figs. 1, 2, 3, 4 and 7. The two final molding dies 20 are guided for inclined upward movement toward the molding plug 21 along fixed guideways 75 firmly secured to the

main frame 10, and carry pins 76 coacting with inclined guide slots 77 formed in a fixed backing plate 81. The dies are movable by means of a sturdy U-shaped yoke 78 operable by the power cylinder 48 and having rollers 79 engaging the lower flat surfaces of the dies 20. The yoke 78 also carries a kick-back plate 74 shown in Fig. 1 and which is cooperable with the pins 76, and the yoke is guided for vertical movement along parallel beams of the frame 10 by other rollers 80, being firmly attached to the piston rod of the power cylinder 48 as illustrated in Figs. 3 and 7. The yoke 78 furthermore slidably coacts with the rigid backing plate 81 in which the slots 77 are formed and which normally conceals the rollers 79, 80 and the guideways 75. The molding plug 21 is pivotally suspended from the top of the plate 81 by a pin 82 so as to permit the plug 21 to be swung away from the plate 81 during final ejection of the finished shoe counters, as depicted in Figs. 2 and 7. The molding surfaces of the dies 20 and of the plug 21 should be shaped to accurately form the upper heel embracing walls 22 of the particular counters being manufactured, and these elements may be readily removed and replaced by others whenever different shaped counters are to be produced. The final molding plug 21 is so located that the successive pre-formed blanks 12 delivered by the forwardly advancing carriage 55 will properly enter the final molding zone.

The fluid pressure actuated flange forming slide 24 and ironing roller 25, which are adapted to produce the inwardly directed lower flanges 26 of the successive counters, while the blanks 12 are still being held firmly between the molding plug 21 and the dies 20, are mounted for vertical movement across the molding zone, by elongated parallel guides 84 secured to the frame 10 by bolts 85, see Figs. 1, 2, 3, 4 and 7. The slide 24 is movable along these guides 84 by the power cylinder 47, the cylindrical casing of which is swingably supported upon the frame 10 by a pivot pin 86, and the piston rod of which is connected by a cross-head 87 to the medical portions of spaced levers 88 one end of each of which is swingable about a fixed pivot 89 and the opposite end of each of which is pivotally connected to the slide 24 by a link 90, see Fig. 3. The flanging slide 24 is provided with a central tapered and laterally curved recess 92 which is adapted to engage the projecting lower edge portion of each blank 12 when the slide is elevated along the guides 84 and the blank is firmly held between the plug 21 and the dies 20, and to thereby turn the flange 26 inwardly, as shown in Fig. 4. The ironing roller 25 which is carried directly by the slide 24 beneath the recess 92, is adapted to press and iron the initially inturned flanges thus produced by the recess 92 into final permanent formation so as to complete the counter as illustrated in Fig. 8; and it is noteworthy that all of these operations are performed without artificially heating the blanks 12.

The fluid pressure actuated ejector 27 for swinging the molding plug 21 about its suspension pivot 82 away from the backing plate 81 in order to eject the finished counters from within the molding zone is shown in Figs. 1, 3 and 7, and comprises a reciprocable pusher bar passing through an opening in the plate 81 and coacting with the mid-portion of the plug 21. This bar ejector 27 is periodically operable to swing the plug 21 away from the plate 81, whenever a counter has been completed and the dies 20 have

been retracted, by means of the revolving cam 36 which coacts with one end of the lever 42 and the medial portion of which is swingable upon a pivot 93 while its opposite end is connected by a link 94 to the swinging end of an arm 95 secured to a pivot shaft 96. The pivot shaft 96 is mounted to oscillate in brackets 97 firmly secured to the main frame 10, and a lever 98 attached to the mid-portion of the pivot shaft 96 has its swinging end pivotally connected to the outer end of the ejector bar 27. A tension spring 99 has one end connected to the frame 10 while its opposite end is attached to the outer swinging end of the cam actuated lever 42; so that whenever the cam 36 disengages the lever 42 after a counter has been ejected from within the molding zone and has dropped off of the plug 21, the spring 99 will quickly retract the ejector 27 and return the plug 21 to active position within the molding zone.

All of the mechanisms hereinabove described are provided with suitable adjustments and interchangeable parts, in order to insure automatic and reliable operation when producing shoe counters of different sizes and shapes, and since all parts are mounted upon the common main frame 10, the machine may be transported and installed as a single relatively compact unit. When the unit has been properly adjusted and connected to sources of electric power and fluid under pressure, it may be placed in commercial operation to automatically carry on my improved method, by merely actuating the switch 28 to operate the electric motor 15, and by thereafter constantly feeding sheet stock 13 to the fluid pressure actuated punch and die assembly 11. The motor 15 simultaneously drives the skiver 14 through the chain drive 50, the belt conveyor 18 through the chain drive 53, and the cam shaft 29 through the chain drive 30, all in a well known manner, and the rotating cam shaft 29 constantly revolves the cams 31, 32, 33, 34, 35, 36.

The revolving cam 31 actuates the valve mechanism 37 which controls the operation of the initial blanking punch and die assembly 11 by the fluid pressure actuated servomotor 44. As the stock 13 is fed through the die assembly 11 the rough cut blanks 12 are produced in rapid succession and they may thereafter be transferred to the skiver 14 in any convenient manner. The skiver 14 which is being actuated by the chain drive 50, quickly skives or tapers the peripheral edges of the successive blanks 12 in a well known manner and delivers the skived blanks to the upper stretch of the belt conveyor 18, which is constantly travelling toward the rear of the unit. The conveyor 18 is driven by the chain drive 53, and as the successive skived flat blanks 12 reach the end of the upper conveyor stretch, they are inverted, lowered and returned to the upper surface of the transversely movable carriage 55, by the auxiliary conveyor 54 which coacts with the rear bend of the main conveyor 18 to carry the successive blanks about this bend.

When each of the successive skived flat blanks 12 is dropped onto the carriage 55, the feed plate 16 is retracted sufficiently so as not to interfere with the descending blank, and the movements of the carriage and plate are effected by the power cylinder 46 which is controlled by the valve 39 actuated by the revolving cam 33. Immediately after a flat blank 12 has been thus deposited upon the carriage 55, the feed plate 16 is moved toward the left as viewed in Fig. 3, and the carriage 55 is simultaneously shifted toward the right along the rails 17, by the admission of

fluid to the left displacement chamber of the power cylinder 46, thus causing the flat counter blank to be shifted to the left onto the lower pins 23. While thus positioned, the cam 32 coacts with the valve 38 to admit fluid to the lower displacement chamber of the power cylinder 45 carried by the lower plate 71, thus quickly elevating the saddle die 69 and initially bending the blank 12 into U-shape about the plug 69 carried by the upper plate 67, as in Fig. 6.

This pre-formation of each blank 12 into U-shape, is accomplished by applying pressure to the lower straight edge portion only of the blank, and while the upper major portion thereof projects outwardly to the left, beyond the die 69 and plug 68; and promptly after the initial bending has been effected, fluid is admitted to the right displacement chamber of the power cylinder 46 as viewed in Fig. 3, thereby retracting the feed plate toward the right and moving the carriage 55 toward the left along the rails 17. This movement of the plate and carriage retracts the plate sufficiently to permit the next succeeding flat blank 12 to be deposited upon the carriage deck, and also transfers the initially bent blank which is being held between the saddle die 69 and the plug 68 into the final molding zone between the dies 20 and the plug 21. During this transfer motion of the carriage 55 toward the left, the pins 23 are pushed back against the springs 72 and fluid is also admitted to the upper displacement chamber of the power cylinder 45 so as to lower the saddle die 69 and to thereby release the U-shaped blank 12.

Upon transfer of each U-shaped blank 12 to the final molding zone, the revolving cam 35 coacts with the valve 41 to admit fluid to the lower displacement chamber of the power cylinder 43, and to thereby elevate the yoke 78, thus moving the two final molding dies upwardly and inwardly toward the plug 21. This action finally molds the upper counter wall 22 and is accomplished while the lower edge portion of the blank 12 is projecting to the left away from the molding zone, as shown in Fig. 4. After final molding of the wall 22 has been effected and while each blank 12 is still being held firmly between the dies 20 and the plug 21, the revolving cam 34 actuates the valve 40 to admit fluid to the lower displacement chamber of the power cylinder 47, thereby moving the slide 24 and the roller 25 upyardly along the guides 84 and forming the base flange 26 of the counter by first folding this flange inwardly and subsequently ironing the same into permanent formation. When each flange 26 has been thus formed, fluid is quickly admitted to the upper displacement chamber of the power cylinder 47; and as the slide 24 descends from the final molding zone, fluid is also promptly admitted to the upper displacement chamber of the power cylinder 48 so as to lower the dies 20 with the aid of the kick-back plate 74 coacting with the pins 76, and to thereby release the completed counter.

Immediately following each such release of a finished counter, the counter spreads slightly, and the revolving cam 36 engages the lever 42 and thereby causes the ejector 27 to become effective to swing the molding plug 21 and the slightly distended counter outwardly away from its backing plate 81, and to tension the spring 99. The finished slightly distended counter then drops by gravity away from the plug 21 and is ready for use, and the successive completed counters may be removed from the unit in any desired manner

as with an ordinary inclined discharge chute, and when the cam 36 disengages the lever 42 after each final counter ejection, the tensioned spring 99 quickly returns the ejector 27 and the plug 21 to proper position preparatory to final molding and ejection of the next blank 12. All of these several steps are performed automatically and in rapid succession, and the several cams and valves are constructed and timed to insure proper performance of the power cylinder at all times.

It will be noted from the foregoing description of the normal operation of the mechanisms, that the improved method of producing the counters, involves a series of steps which are positively repeated to produce successive perfect and similarly shaped counters, without necessity of applying artificial heat or otherwise treating the blanks 12, except to properly form the same. The improved machine is operable to rapidly exploit the method and to produce from thirty to forty completed counters per minute, and the omission of artificial heat prevents possible burning or scorching of the counters especially when utilizing fibre stock 13. It has also been found that counters produced by the present improved method, are stronger and definitely retain their shape for a longer period of time than those produced with the much slower present commercial methods, and various styles and sizes of counters may be readily produced by merely replacing a few parts of the assemblage and by following the same line of procedure.

From the foregoing detailed description of the construction and operation of the commercial machine, it should also be apparent that my invention not only provides an improved method of rapidly and automatically manufacturing successive perfect shoe counters, but also provides improved mechanism for expediting exploitation of the new method. The improved method and apparatus permit the production of diverse styles, shapes and sizes of shoe counters at moderate cost and in rapid succession; and the improved mechanism is relatively simple and positive in action and has proven highly successful in actual use. While the initial formation of the flat blanks 12 and the skiving of the edges thereof are old and well known procedure, the initial bending of the blanks 12 into U-shape, the final molding of the walls 22, and the formation of the flanges 26 are important features of this invention and contribute to the success of my new method. The mechanism performs the successive operations smoothly and without excessive attention, and the unitary construction of the machine permits the same to be readily transported and installed in limited spaces.

It should be understood that it is not desired to limit this invention to the exact steps of the method or to the precise details of construction of the apparatus, herein shown and described, for various modifications within the scope of the appended claims, may occur to persons skilled in the art.

I claim:

1. In combination, a reciprocable carriage having thereon a forming plug for bending flat shoe counter blanks into definite U-shape, a swingable die formed to receive the U-shaped blanks in succession directly from said initial bending plug and to position the same within a pressing zone, means for pressing the upper portions of the successive blanks into final shape within said zone, means for finally rolling a flange upon the lower portions of the successive blanks while confined within said zone, and means for swinging said die out of said zone to eject the counters therefrom.

2. In combination, a movable carriage having thereon a set of forming elements for bending a flat shoe counter blank into a definite U-shape, means for moving said carriage to remove the U-shaped blank from said initial bending means and for positioning the same within a pressing zone, elements for pressing the upper portion of the blank into final shape within said zone, means for rolling the lower portion of the blank inwardly while the pressing pressure is still applied, and means for moving a portion of said pressing means out of said zone to thereby eject the counter.

3. In combination, means forming a counter pressing zone, a final forming plug swingable mounted within said zone, an initial forming plug movable toward said zone for pre-bending and applying a pre-bent counter blank to said final plug while disposed within said zone, pressure applying blocks movable upwardly and inwardly toward said plug to finally form the blank positioned within said zone by said plug, and means for swinging said plug out of said zone to eject the counter therefrom.

4. In combination, means forming a counter forming zone, a plug for distorting flat blanks into U-shape near and being movable toward said zone, another plug within said zone, a reciprocable carriage for transferring U-shaped blanks from said first plug to the second plug while the latter is confined within said zone, means cooperating with said second plug to press said blanks into final shape within said zone, rollers coacting with said second plug to form flanges upon the counters confined within said zone, and means for swinging said second plug out of said zone to eject the finished counters from said zone.

5. In combination, a frame having thereon a final counter forming zone, a reciprocable plug for initially bending counter blanks and being movable to position counter blanks within said zone, a final molding plug pivotally suspended within said zone, means cooperating with said final plug to press said blanks into predetermined shape within said zone, and means for swinging said final plug out of said zone to eject the finished counters from said zone when said cooperating pressing means are inactive and said initial plug has been moved away from the zone.

6. A shoe counter former, comprising, means providing a final forming zone, a carriage movable toward said zone, a plug and die carried by said carriage for initially bending the successive counter blanks into U-shape, means for delivering the successive blanks into position to be acted upon by said plug and die, a second plug movably mounted within said final forming zone, means for moving said carriage to deliver the successive initially bent counters into said zone and onto said second plug, dies and rollers cooperable with said second plug to finally form the counters, and means for moving said second plug out of said zone to eject the finished counters.

7. A shoe counter former, comprising, means providing a final forming zone, a carriage movable toward said zone, a plug and die movable with said carriage and being cooperable to initially bend the successive counter blanks into U-shape, means mounted on said carriage for delivering the successive flat blanks into position to

be acted upon by said plug and die, a second plug pivotally suspended within said final forming zone, means for moving said carriage to deliver the successive initially bent counters into said zone and onto said second plug, dies cooperable with said second plug to finally shape the upper portions of the counters, means cooperable with said second plug to roll a flange upon the lower portion of each counter, and means for swinging said second plug out of said zone to eject the final counters.

8. A shoe counter former, comprising, means forming a final counter shaping zone, a carriage movable toward said zone, a plug and die mounted upon said carriage and being cooperable to initially bend the successive counter blanks into U-shape and to thereafter clamp each blank along its lower edge, means mounted upon said carriage for delivering the successive blanks to the plug and die assembly, a second plug movably mounted within said final shaping zone, means for moving said carriage to project the upper portions of the successive U-shaped counters into said zone, dies and rollers cooperable with said second plug to finally shape the successive counters within said zone, and means for moving said second plug to eject the finished counters from said zone.

9. A shoe counter former, comprising, means forming a final counter shaping zone, a carriage movable toward said zone, a plug and die mounted upon said carriage and being cooperable to initially bend the successive counter blanks into U-shape and to thereafter clamp each blank along its lower edge, means mounted upon said carriage for delivering the successive blanks to the plug and die assembly, a second plug pivotally suspended within said final shaping zone, means for moving said carriage to deliver the upper portions of the successive U-shaped counters into said zone and about said pivoted plug, dies cooperable with said second plug to shape the upper counter portions and to hold the counters within said zone, means for flanging the lower portions of the held counters, and means for swinging said second plug out of said zone to eject the finished counters.

10. The method of manufacturing shoe counters, which comprises, initially bending each flat and peripherally skived counter blank into U-shape while moving the same horizontally into a final forming zone, molding the major portion of each U-shaped blank into final form within said zone and thereafter firmly holding each blank at the finally shaped portion thereof while the skived bottom edge of the blank protrudes from the zone, rolling the projecting edge of the held blank in the form of an inwardly directed flange, and positively ejecting the finished counters from said zone by swinging the final forming means outwardly and upwardly away from the zone.

HENRY GARYAIT.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
513,242	Moore	Jan. 23, 1894
1,138,123	Lancey	May 4, 1915
1,471,261	Heath	Oct. 16, 1923
1,856,296	Spadafora	May 3, 1932
1,874,703	Jacquemin	Aug. 30, 1932
2,152,838	Castonquay	Apr. 4, 1939
2,185,937	Bailey	Jan. 2, 1940