

N. M. STANLEY.

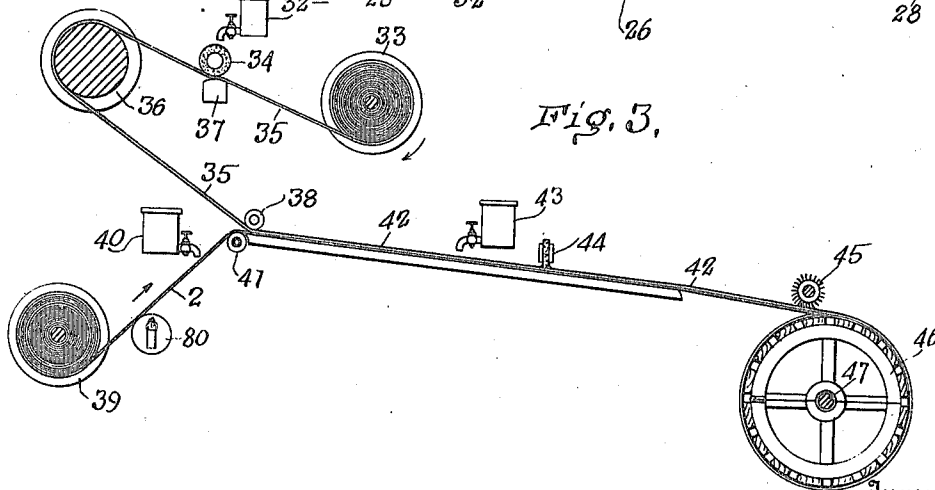
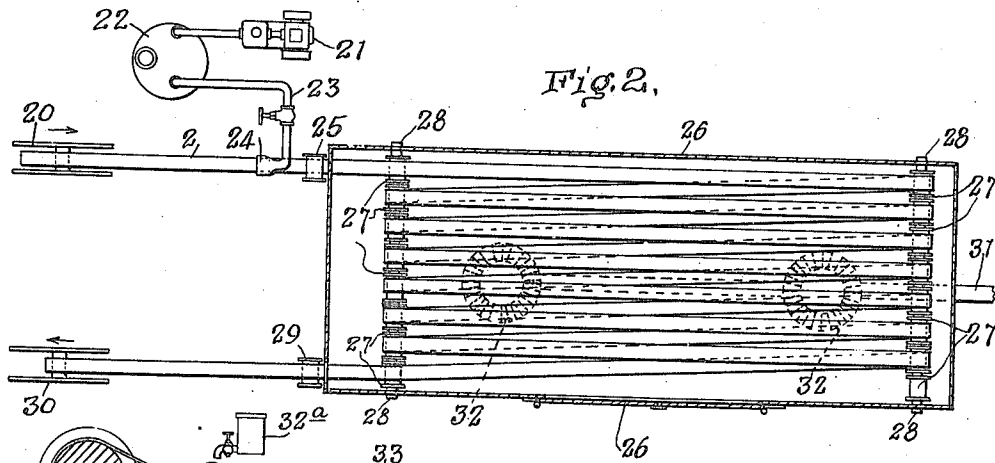
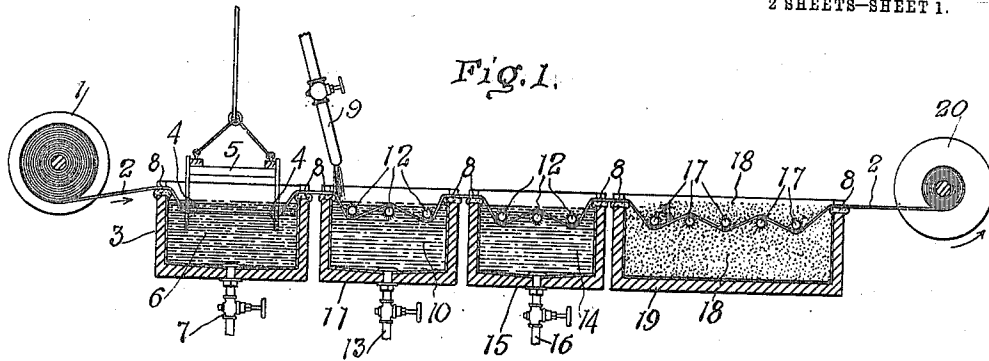
PROCESS FOR MAKING COMPOSITE METALLIC AND NON-METALLIC STOCK.

APPLICATION FILED DEC. 17, 1913.

1,128,071.

Patented Feb. 9, 1915.

2 SHEETS—SHEET 1.



Witnesses

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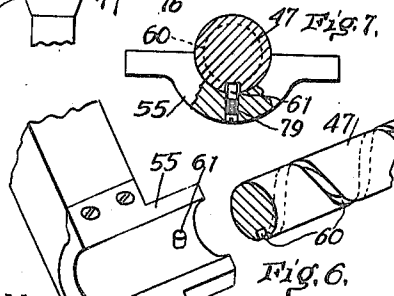
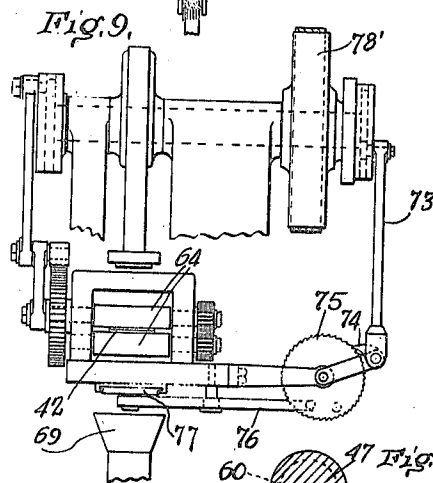
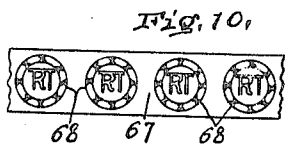
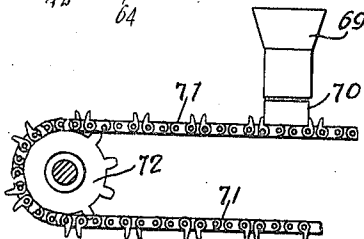
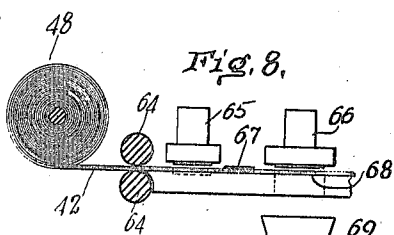
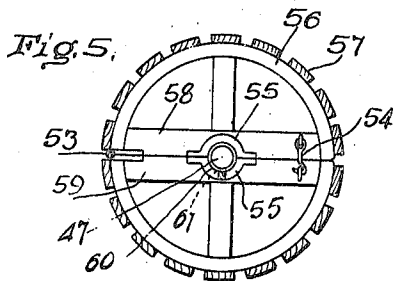
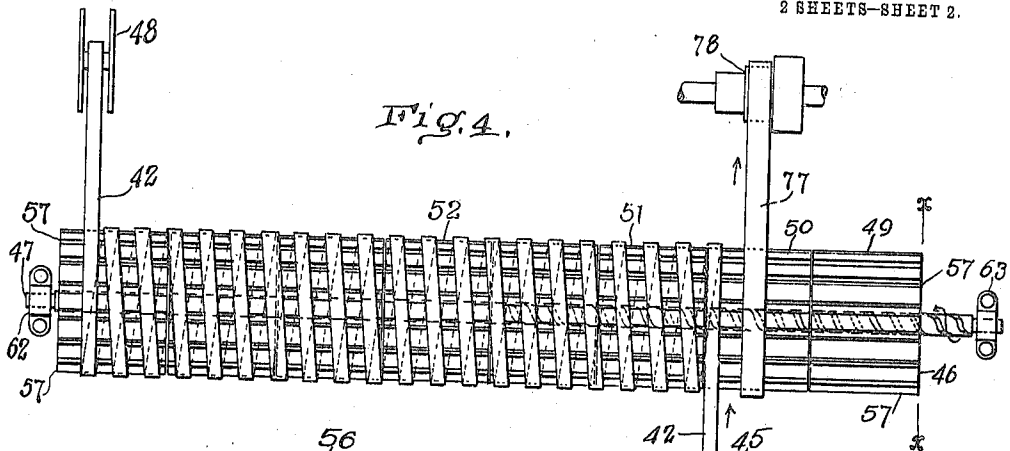


Fig. 11.



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UNITED STATES PATENT OFFICE.

NATHAN M. STANLEY, OF DAYTON, OHIO.

PROCESS FOR MAKING COMPOSITE METALLIC AND NON-METALLIC STOCK.

1,128,071.

Specification of Letters Patent.

Patented Feb. 9, 1915.

Application filed December 17, 1913. Serial No. 807,188.

To all whom it may concern:

Be it known that I, NATHAN M. STANLEY, a citizen of the United States, residing at Dayton, in the county of Montgomery and State of Ohio, have invented certain new and useful Improvements in Processes for Making Composite Metallic and Non-Metallic Stock, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to a process for making composite metallic and non-metallic stock, preferably in the form of a long strip or ribbon, and embossing and severing sections of said stock to constitute a product in the nature of labels for application to articles of commerce.

The object of the invention is to produce, more expeditiously, and in a cheapened manner such labels, and to emboss thereon letters, figures, designs, and decorations of various kinds, applicable to a variety of articles as candy boxes, hats, music cases, for marking, illuminating or decorating the same, or for other useful purposes.

The present invention relates to improvements upon the process set forth in my former Patents No. 1,018,138, issued February 20th, 1912, and No. 961,550, issued June 14th, 1910.

In the accompanying drawings:—Figure 1 is a longitudinal vertical section of the receptacles for acid, water and drying material through which the metallic material passes. Fig. 2 is a top plan view of the lacquer sprayer and the baking oven. Fig. 3 is a side view of the metallic and non-metallic materials, in the process of being united. Fig. 4 is a plan view of the drying reel. Fig. 5 is an end view of the drying reel. Fig. 6 is a perspective view of portions of the drying reel shaft and reel bearing. Fig. 7 is a cross section of said shaft showing the spring plunger in engagement with it, with the bearing partly broken away to show that plunger. Fig. 8 is a detail view, partly in side elevation and partly in vertical section, of the apparatus for embossing and cutting out the composite material, showing a portion of the conveyer. Fig. 9 is an end view of the apparatus for embossing and stamping the composite stock. Fig. 10 is a strip of composite stock embossed. Fig. 11 is a view of a specimen of the product produced by the process.

Under my Letters Patent No. 1,018,138 the process consisted in winding spirally upon a reel the metal ribbon, and dipping the reel by hand into an alkaline bath to remove the grease, etc., from the metal; removing the reel from the alkali and immersing it by hand in a receptacle of water to cleanse it; then dipping the reel in receptacles containing acid and water respectively, to give the metal a mat-surface and to cleanse it of acid and the soluble precipitates. After this the reel was placed in a receptacle or crock containing suitable drying material, as sawdust, and was moved about therein so that the surface of the metal was thoroughly dried.

Under my Letters Patent No. 961,550, the process was to move the metal through an acid bath and then pass it through an alkaline bath to neutralize the effect of the acid on the metal. I then unwound the metal over a heated drum and applied an adhesive directly to the metal; the adhesive was contained in a receptacle surrounded by a water chamber to provide a means of keeping the adhesive at a proper consistency for application to the metal surface. I then wound the metal upon a drum so that the adhesive could dry. After this, I subjected the ribbon to a die and punch, and the resultant letter or figure was, by pressure, forced into the surface to which it was to be attached so that the letter would lie flush with the surface of the material supporting it and become firmly embedded therein.

When the metallic strip enters my present process it comes as clean stock and passes from a suitable reel into a bath of acid to give it a mat-surface, and while in the acid, is drawn through slotted apertures in vertical zinc plates, placed one at the entrance of the ribbon to the acid bath and one at the exit from the acid in such a position as to keep the ribbon in the bath, flex it slightly to permit the acid to react fully, yet not to so bend it as to spread, warp, twist, or pull the ribbon, which has been a serious difficulty when frequently flexed or reeled. The inherent difficulty of rolls moving in an acid bath is thus obviated.

The ribbon passes directly in unbroken movement, under a water spray, through water baths, being threaded under and over small revolving brushes provided with

flanges on each end to prevent a lateral movement of the ribbon, so that metallic sulfates resultant from the chemical action of acid on metal are thoroughly removed; thence, directly in uninterrupted progress, the ribbon passes into a receptacle containing an abrasive, absorbent drying material, as for instance sawdust, where the ribbon is threaded between revolving brushes having flanges at each end to prevent a lateral movement of the ribbon, so that all portions of the ribbon are dried, cleansed, and polished during its passage throughout the length of the drying receptacle. I now have a mat-like surface thoroughly cleansed, dried, and polished, having been flexed only to a minimum extent, and reeled but once, and at no time having been touched by hand. In the passage from bath to bath, the ribbon is protected from injury by the sharp edges of the receptacle by means of a pad of soft absorbent material placed on such edge, as soft leather.

Referring to Fig. 1, 1 designates the reel of metal, 2 is the metal ribbon as unwound from the reel passing directly through the apertures 4, in frame 5, placed in the acid 6, contained in receptacle 3. The container or receptacle is drained by the waycock 7. The ribbon passes over pads 8, under a water spray 9, and into a water bath 10 in and between brushes 12, 12, in a container 11, drained by a cock 13. The ribbon then passes over pads 8, and over and under brushes 12, 12, in a second water bath 14, in a container 15 drained by a cock 16. Thence, the ribbon is conducted over the pads 8, 8, under and over brushes 17, 17, through drying material 18 in a container 19, and reeled on a reel 20. I next apply to one surface of the strip a lacquer, and then bake the lacquered strip in order to prevent any tarnishing of the finished product, and to secure great durability and beauty. In this baking step, I pass the ribbon through an oven, wherein the lacquered metal is baked at a suitable temperature for the requisite time. The ribbon is strung or draped the length of the oven over spools, at no time abruptly reeled or strained unduly. During its passage through the oven at a pre-determined speed, it thus remains a pre-determined time therein, acquiring a uniform luster. The ribbon is now in reeled form.

Referring to Fig. 2, 21 designates an air compressor furnishing air to the lacquer tank 22, from which lacquer is forced through tube 23 and spreader 24, onto the metal ribbon 2 passing thereunder. The ribbon 2 passes thence over a guiding roll 25 into a baking oven 26, where it is draped over rolls 27, 27, placed at opposite ends of the oven and turning on shafts 28, 28. When baked, the lacquered ribbon passes out of the oven over a guiding roll or sheave 29, and is

reeled at 30. The heat supply pipe for oven 26 is at 31, feeding burners or other suitable apparatus at 32. I then take the finished reel of metallic ribbon and apply a coat of warmed adhesive to the mat-surface as it is unreeled, and, preferably, while it is still warm, join with it a non-metallic material whose underface coincides with the metallic ribbon, and whose upper face has a coat of glue upon it already. This non-metallic material is moistened by a sizing substance so that there is secured a perfect spread of the subsequent coat of adhesive at all parts of the ribbon. In order to secure a very perfect product, this composite metallic and non-metallic ribbon is passed over a pad and another coat of glue applied to the face of the non-metallic side of the composite ribbon. This step in the process is both more effective and practical, and considerably faster than the old method, as at no time is the ribbon reeled on a small roll while being handled, and the treatment of it by hand is reduced to a minimum.

Referring to Fig. 3, 33 indicates the reel of paper ribbon 35 passing under a moistener consisting of a cup 32^a containing the sizing, a roll 34, and a pad 37; the paper ribbon passes over the revolving sheave 36 and thence directly beneath the roll 38 where it is joined with the glued surface of the metal ribbon 2 which is unreeled from the reel 39. The metal ribbon may pass over a burner 80, as desired, thence under a glue cup 40 where the glue is applied, and thence over roll 41 to a point under roll 38, where ribbons 35 and 2 are joined. The conjoined stock passes as the ribbon 42, under glue cup 43 where a coating of adhesive is applied to the non-metallic side of the ribbon; the adhesive is applied evenly by spreader 44. I then pass the ribbon on to a long revolving roll or reel of large diameter composed of a series of sections. As the ribbon passes on to the reel, there is a suitable revolving brush which engages and rubs the surface of the ribbon having the coat of adhesive, causing the metallic and the non-metallic ribbons to adhere closely to each other. This is particularly valuable when the air is very dry. As the ribbon is exposed in its progress over the reel to varied currents of air, it is not stretched, warped, or twisted unduly, for by virtue of the large diameter of the reel, the ribbon can be spirally wound at a low pitch, thus causing a minimum amount of transverse strain upon the ribbon. If this strain were large in amount the non-metallic ribbon might buckle on the metallic ribbon. From the large reel I pass the ribbon to a small reel.

Referring to Fig. 4, the composite stock passes under brush 45, and then is spirally wound on reel 46 revolving on shaft 47. This reel 46 has the ribbon 42, of composite

material, wound upon it spirally, at a low pitch. Immediately before passing to the reel 46, the ribbon 42 engages the brush 45. When the ribbon 42 has revolved the course of the reel, it passes to a small reel 48 where it is concentrically wound. The reel is revolved by a band 77 from power pulley 78.

Fig. 5 indicates an end view of the reel 46. This section of the reel, as well as the other sections of the entire reel, is divided in halves 58 and 59, hinged at 53 and latched at 54 on shaft 47. Bearings 55 embrace the shaft 47. Rims 56, support cleats 57 arranged about the periphery of the reel, parallel to its longitudinal axis.

Fig. 6 is a perspective of the shaft 47, in a part of whose length runs a spiral groove 60. A spring plunger 61, carried in the bearing 55, at right angles to the axis of the shaft, travels in the spiral groove 60, moving the sections 49, 50, etc., of the reel progressively forward toward bearing 62 from bearing 63, which bearings support shaft 47.

Referring to Fig. 7, in the bearing 55 is shown a plunger 61, 79 being a spring holding the plunger in engagement with the shaft 47, while traveling in the groove 60, the plunger and spring being carried in bearing 55.

The composite stock passes from the small reel at a determinable rate under an embossing die or other die, and a cutting die, to remove the design and a suitable area about it from the ribbon. These several portions, now constituting labels or individual letters, characters, etc., as the case may be, are automatically counted, until a suitable number have accumulated. They are then dropped through a guide chute into a box in which they can be finally packed, as desired. This box is one of a series, automatically transported on an endless chain carrier traveling at a pre-determined rate, the empty boxes being suitably brought into position at a moment when the labels are released.

Referring to Fig. 8, 48 is the reel of composite stock passing as a ribbon 42, between the guiding rolls 64, 64, under an embossing die 65, and a punch 66 which severs from the now embossed stock 67 the design and suitable adjacent area 68, from the ribbon. The severed portions fall into a chute 69, and thence into box 70 or the like, carried on endless chain 71, propelled by sprocket wheel 72.

In Fig. 9 is illustrated, in addition to the embossing and stamping apparatus, a conventional counting mechanism comprising an adjustable arm 73 which actuates a pawl 74 that operates a ratchet 75 operating a cut-off 77, through a pitman 76. Motion is delivered to this mechanism through pulley 78'.

Fig. 10 is the composite ribbon 67 with designs 68 embossed thereon. Fig. 11 is the completed product, with design 68 and suitable adjacent area constituting the label.

I may, also, lacquer the finished product in order to doubly insure the face of the label from tarnishing. This may be performed by moving the labels when finished, in the above manner, on an endless chain conveyer under a lacquer spray and allowing the product to dry in the air currents. Thus the product will have a perfect coat of lacquer whether the original lacquer was disturbed by the embossing and punching or not.

It may be remarked that to avoid injury to the fine metal ribbon, it is particularly desirable to flex, wind, bend, or handle it as little as possible. The minimum of this is attained in my improved process; speed and economy of time and space, are also effected to a greater degree by this process than has been heretofore possible in the art.

It will be apparent that the details described may be varied more or less without departing from the essential steps in carrying out the process. I, therefore, do not wish to limit myself to those unessentials.

The embossing and severing can, of course, be limited to embossing and severing individual or separate letters or characters, as distinguished from embossing a group of letters or characters and severing a section of the stock containing such group, but the latter is the preferred product of the process.

Having thus described my process, I claim:—

1. The above described process of making labels, letters, decorations, or representations, of composite material, for attachment to surfaces, by producing a mat-surface on a metal strip; drying said strip; applying an adhesive to said strip; uniting a non-metallic material to said strip by said adhesive; applying an adhesive to the exposed surface of said non-metallic material; drying the now composite stock; embossing a portion thereof, and severing the embossed portion.

2. The above described process of making labels, letters, decorations, or representations, of composite material, for attachment to surfaces, consisting in applying an adhesive to a metallic strip having a mat-surface; uniting a non-metallic material to said strip by said adhesive, said material being substantially of the same width as said metallic strip; applying an adhesive to the exposed surface of said non-metallic material; drying the now composite stock; embossing a portion thereof, and severing the embossed portion.

3. The above described process of making labels, decorations or representations, of

composite material, for attachment to surfaces, by producing a mat-surface on a metallic strip; drying said strip; applying an adhesive to said strip; uniting a non-metallic material to said metallic strip by said adhesive; applying an adhesive to the exposed surface of said non-metallic material; drying the now composite stock; embossing the stock; and severing the embossed portion and adjacent area to form labels.

4. The above described process of making labels, letters, decorations, or representations, of composite material, for attachment to surfaces, by producing a mat-surface on a metal strip by moving it through an acid bath; cleaning said strip by moving it through water baths, over and under revolving brushes; drying and polishing said strip by moving it through an abrasive absorbent; reeling said strip; unreeling and lacquering said strip by applying a lacquer upon one surface thereof; baking the lacquer on said strip by passing it through a heating chamber; again reeling said strip; later unreeling said strip and reheating it preparatory to the application thereto of an adhesive; uniting the non-metallic material to said strip by said adhesive; applying an adhesive to the exposed surface of said non-metallic material; working the strips into close union by rubbing; drying the now composite stock by moving it through the

air and reeling it; unreeling said stock and embossing it; and severing portions thereof.

5. The above described process of making labels, letters, decorations, or representations, of composite material, for attachment to surfaces, by producing a mat-surface on a metal strip by moving it through an acid bath; cleaning said strip by moving it through water baths, over and under revolving brushes; drying and polishing said strip by moving it through an abrasive absorbent; reeling said strip; unreeling and lacquering said strip by applying a lacquer upon one surface thereof; baking the lacquer on said strip by passing it through a heating chamber; again reeling said strip; later unreeling said strip and reheating it preparatory to the application thereto of an adhesive; applying an adhesive to the exposed surface of said non-metallic material; working the strip into close union by rubbing; drying the now composite stock by moving it through the air and reeling it; unreeling said stock and embossing it; and severing portions of the stock; lacquering said sections; and drying said portions.

In testimony whereof, I affix my signature in presence of two witnesses.

NATHAN M. STANLEY.

Witnesses:

F. W. SCHAEFER,
EDWARD S. REED.