April 21, 1942. R. W. POLLEY 2,280,259

PRODUCTION OF ARTICLES WITH VISCOUS COATINGS

Filed July 24, 1940

Fig. 1.

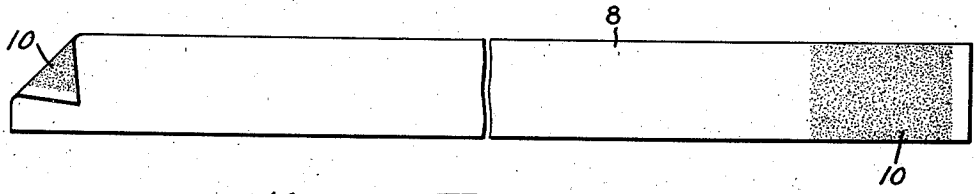


Fig. 2.

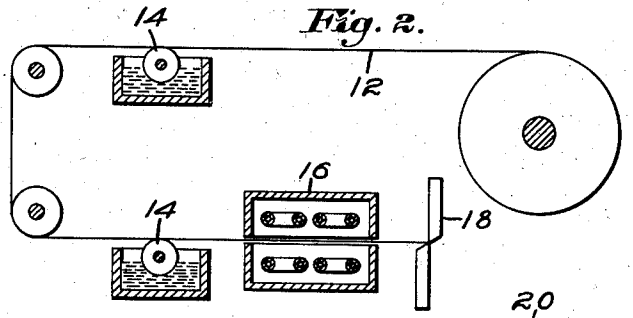
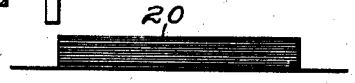


Fig. 3.



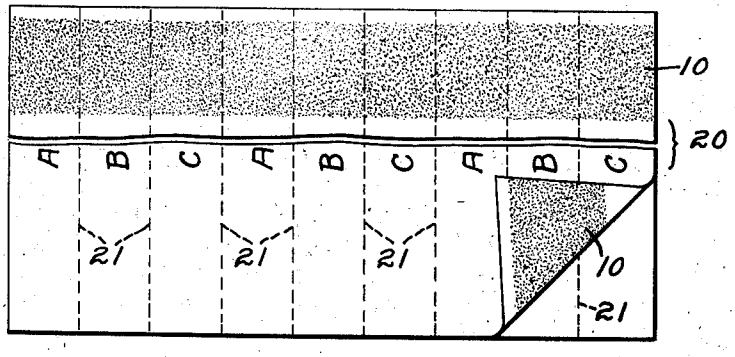


Fig. 4.

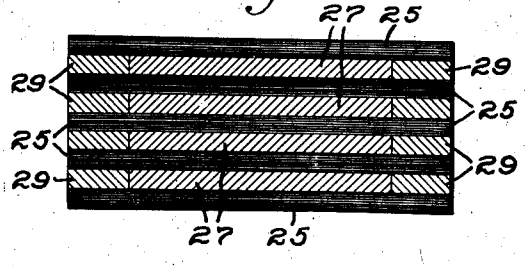
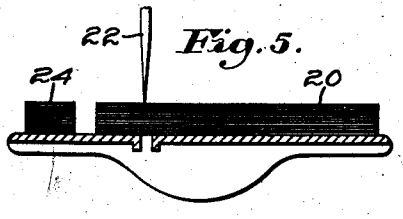


Fig. 5.



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PRODUCTION OF ARTICLES WITH VISCOUS COATINGS

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3 Claims. (Cl. 164—17)

This invention relates to the production of articles of paper or similar sheet material having viscous coatings, and the object is to provide a method permitting the inexpensive and rapid production of such articles from large stock pieces. An example of such an article in the production of which the method is advantageously used is a so-called "shirt band" used for encircling a laundered shirt to hold it in folded form and consisting of a narrow band of paper having at its ends on opposite faces coatings of dried rubber latex. Such coatings will not stick to other articles but when the band is wrapped around a shirt and the two coated surfaces pressed together they will cohere.

My invention will be well understood by reference to the following description, wherein for convenience I will speak specifically of a shirt band as the article produced, taken in connection with the accompanying drawing, wherein—

Fig. 1 is a broken plan view of a shirt band;

Fig. 2 is a diagram illustrating certain steps in its production;

Fig. 3 is a broken plan view of a block or lift consisting of superposed sheets from each of which a plurality of bands may be formed; and

Figs. 4 and 5 are diagrams illustrating further steps in the process.

Referring to Fig. 1, I have there shown a shirt band consisting of a narrow strip of paper 8 which might, for example, be about 19 inches long and 1½ inches wide and having adjacent its ends on opposite faces coatings 10 of dried rubber latex so that when the band is wrapped around the shirt the two coatings will be presented in opposition and may cohere one with another. It will be clear that such coatings might most advantageously be applied to the band by some such method as that illustrated diagrammatically in Fig. 2 wherein a web of paper 12 of the same width as the length of the band (or a multiple of that width, the web subsequently being slit) is drawn past suitable coating devices such as the rolls 14 which would apply to the opposed faces thereof coatings of latex in the form of stripes longitudinal of the web, these coatings being dried thereon by suitable drying mechanism, herein diagrammatically illustrated at 16. This web with the dried stripes of coating material thereon could be divided transversely to form bands as shown in Fig. 1. However, it has hitherto been necessary to chop these bands one by one from the end of the web by means of a pair of cutting blades, and particularly because of the very narrow width of the bands this has been a slow process and very taxing on the machinery employed even at relatively low rates of production. It has hitherto been found impractical to cut simultaneously a number of thicknesses of the coated material because the cuts would intersect the latex coatings and the cutting blade would draw the latex out thread-like at the interstices of the bands and across the edges of the same and cause the strips to stick together. My invention provides a simple and practical means for eliminating this objection.

Referring to Fig. 2, I have there illustrated diagrammatically a step which consists in sheeting the coated web 12 at some suitable time in the process by means of a cutting mechanism 18 to produce sheets of a length equal to a multiple of the width of the finished band, which sheets may be assembled in piles 20 of a convenient thickness. A broken plan of such a pile is shown in Fig. 3 wherein the dotted lines indicate lines along which such a pile may be divided to form sections each consisting of, say, 500 bands. The letters A, B and C appearing in this figure are examples of different legends, such as the name of a laundry, which may be printed on the bands, and they indicate that different legends may appear on successive bands, which is an advantage of the present method which I will hereinafter more fully refer to.

It is mechanically possible to press-cut a block 20 along the lines 21 of Fig. 3, as diagrammatically illustrated in Fig. 5, by means of a suitable knife of the guillotine type to produce sections 24. In particular one may cut a pile 500 sheets thick at a time, this producing sections each of which might form a commercial package. In Fig. 5 I have shown a section 24 of the block corresponding to a stack of 500 bands at the left as if severed and somewhat moved to the left and the knife 22 as about to sever a second section.

However, because of the viscous nature of the latex, if a block 20 as delivered from the cutting mechanism 18 were operated on as shown in Fig. 5, the latex would be drawn out by the knife 22 at the interstices of the sheets at the location of the cut and smeared along the sides of the section and to a greater or less extent would bridge or join the coatings of different bands so that the various bands would not be free from one another in the sectional pile 24 so that they could be lifted off one after another for use. In accordance with my invention, therefore, I treat the sheets such as shown in Fig. 3 to eliminate temporarily for the duration of the cutting op-

eration illustrated in Fig. 5 the ropiness of the coating material, this being effected by a suitable refrigeration of the same. A suitable method of effecting such refrigeration to eliminate the ropiness of the latex coating which I have found practical is diagrammatically illustrated in Fig. 4. The various sheets may be separated into thinner piles or lifts **25** which I have found convenient in practice to make 100 sheets thick. A number of these lifts may be assembled with spaces **27** therebetween so that the coated edges are exposed beyond the spacers and between these edges may be inserted blocks **29** of solid carbon dioxide (dry ice). The assembly shown in Fig. 4 is placed in a suitable insulated chamber and allowed to stand. Rubber latex is said to become completely brittle at a temperature of about 70° below zero F. I have found it unnecessary in practice to carry the refrigeration to such an extent which would require several hours of exposure by the method illustrated. Refrigeration for about an hour will so stiffen or set the viscous material as to permit it to be cleanly cut by the guillotine knife **22**, as illustrated in Fig. 5, without danger of drawing out the coating material from the interstices between the bands. For this cutting a number of lifts may be reassembled to form a relatively thick block for severance as a unit. In practice the desired degree of refrigeration may be empirically determined as corresponding to a certain period of exposure to the particular refrigerating process used. I do not attempt to state the temperature of the coated paper in degrees, believing that would not be helpful and might be misleading. It is difficult, if not impossible, to measure such a temperature as distinguished from the temperature of the air in the chamber. The air temperatures observed at various parts of the chamber may be substantially different and it may be inferred that temperatures of various lifts or of various sheets in the lifts are not identical when the coatings of all are nevertheless sufficiently congealed to provide for the desired result. In general the temperature is much lower than normal atmospheric temperatures in the United States and may be surmised to be of the general intensity of about fifty to sixty degrees below zero, Fahrenheit, which figures I give by way of indication rather than by way of specification.

A method such as described permits the hands to be produced many times faster than when they are severed one by one from the end of the web.

Obviously an ordinary printing plate may be of considerably greater extent than the width of one of the bands. In the prior methods wherein the bands were severed one by one, they could conveniently be collated only in serial order as severed and thus they had to be of the same character as regards the printing thereon. With the present method, on the contrary, successive bands may have different legends thereon, as indicated by the letters A, B and C in Fig. 3, and these may be arranged in any desired relation or order limited solely by the size of the printing plate, and if the length of the sheets which go up to make block **20** is correlated to the length of the plate or to the repeat of the printing it is clear that in the block **20** illustrated in Fig. 3 all the bands in the left-hand section, for instance, will bear the legend "A" and that when this section is severed to form the section **24** all the bands of that section will be of the same kind. The bands may be of any width or of different widths in the same job since the cutting operation of Fig. 3 may economically be effected by hand feeding. It is thus possible to produce bands for several different customers or different designs of bands at one time and it is economical to print relatively small orders which may be combined with other small orders or with the production of plain, unprinted bands.

I am aware that the invention may be embodied in other specific forms without departing from the spirit or essential attributes thereof, and I therefore desire the present embodiment to be considered in all respects as illustrative and not restrictive; reference being had to the appended claims rather than to the foregoing description to indicate the scope of the invention.

I claim:

1. A method of making articles of sheet material which have at least a partial coating of material viscous at ordinary atmospheric temperatures characterized by press-cutting a pile of coated blanks along lines crossing the coating material thereon while the coated areas are refrigerated to a temperature efficient substantially to eliminate ropiness of the coating material.

2. A method of making articles of sheet material which have at least a partial coating of material viscous at ordinary atmospheric temperatures which comprises applying the coating as a stripe along a web of sheet material, sheeting the web and assembling a pile of the sheets, so refrigerating at least the coated areas substantially to eliminate ropiness of the coating material, and dividing the pile by a cut intersecting said stripe while the work is so refrigerated.

3. The method of cutting articles from blanks having rubber latex coatings thereon which comprises assembling a pile of the blanks with at least the coating in the non-ropy condition characteristic of congelation to a temperature much below normal atmospheric temperatures, and dividing the pile along lines intersecting the coated areas.

ROBERT W. POLLEY.