Dec. 26, 1939. G. W. VON HOFE 2,184,824

METHOD OF AND APPARATUS FOR LABELING

Filed Dec. 28, 1938

Fig. 1.

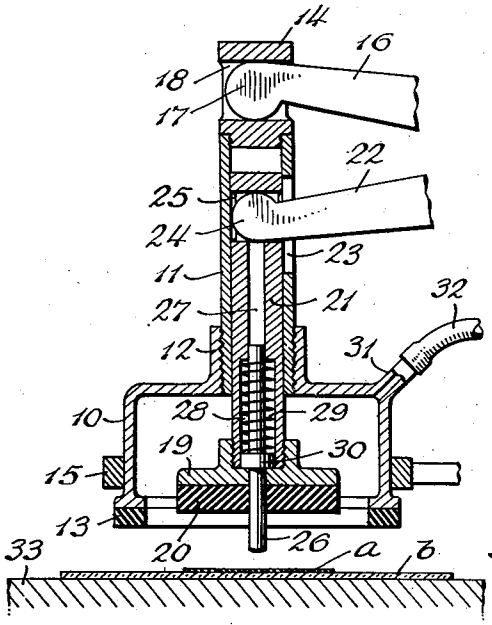



Fig. 2.

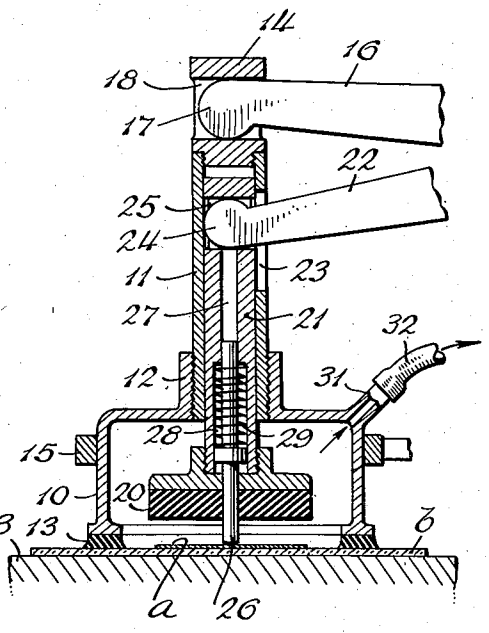



Fig. 3.

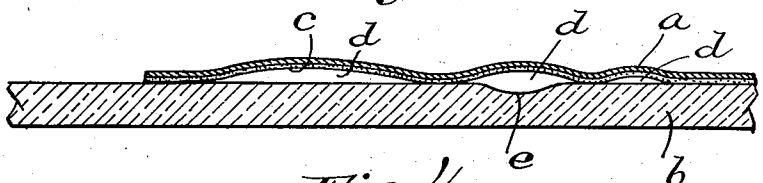



Fig. 4.

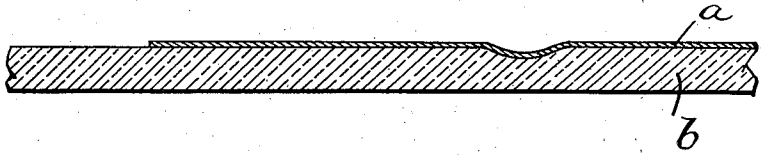
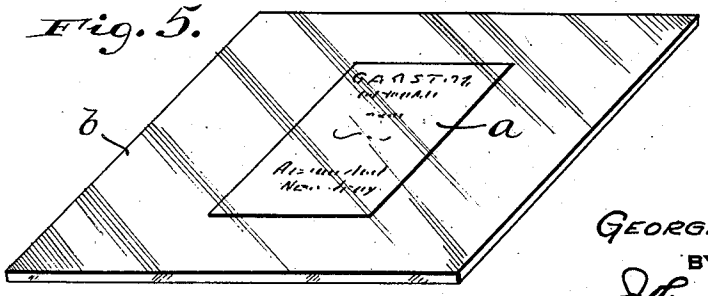



Fig. 5.




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## METHOD OF AND APPARATUS FOR LABELING

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11 Claims. (Cl. 216—51)

This invention relates to the art of applying labels and more particularly to Cellophane labels, decalcomanias, ceramic decalcomanias and the like, and has for its object to provide a novel and simple method whereby said labels, decalcomanias, etc., may be efficiently applied to the articles for which they are designed.

The invention contemplates further the provision of a novel and simple apparatus whereby the novel method may be efficiently carried out.

Other more specific objects will appear from the description hereinafter and the features of novelty will be pointed out in the claims.

In the accompanying drawing, which illustrates the invention without defining its limits, Fig. 1 is a fragmentary sectional view of the novel apparatus; Fig. 2 is a similar view with the parts in a different position; Figs. 3 and 4 are exaggerated sectional views on a greatly enlarged scale illustrating different stages in the application of the labels, and Fig. 5 is a perspective view of an article with a label applied thereto.

It is to be understood that the term "label" as used herein is intended to included Cellophane labels, decalcomanias, ceramic decalcomanias, etc., in addition to those elements commonly referred to as labels or which may reasonably be so designated.

In carrying out the novel method, a label *a* is brought into initial adhesive connection with an article *b* in any convenient manner and in predetermined position thereon; this initial adhesive connection may be effected by means of adhesive applied as a coating or otherwise either to the rear surface of said label *a* or to that part of the surface of the article *b* to which the label *a* is to be applied.

In any case, subsequent to the initial connection of the label *a* with the article *b*, pressure is exerted on a restricted surface portion of the initially applied label *a* to maintain the latter against shifting out of position on the article *b*. The application of the aforesaid pressure on the label *a* is effected in an enclosure or chamber which is substantially air-tight in which a vacuum is subsequently developed or the air pressure is reduced below normal atmospheric pressure, after which pressure is applied to the remaining surface portions in said vacuum or in the presence of air pressure less than atmospheric pressure to complete the adhesive connection of the label *a* with the article *b*.

The novel method may be carried out in any suitable manner as, for instance, by means of the apparatus shown fragmentarily in Figs. 1 and 2. The illustrated apparatus comprises a bell 10 or the like, which is carried by a tubular stem 11 preferably so as to be readily detachable therefrom at will; for instance, as shown, the tubular stem 11 may have its lower end in screwthreaded connection with an upright sleeve 12 formed as an integral part of the bell 10. At its lower end surface, the latter is preferably provided with a rubber or other suitable gasket 13 secured in place in any convenient way for the purpose to be set forth more fully hereinafter. At its upper end, the tubular stem 11 carries a cap or head 14 preferably in screwthreaded connection with said stem 11 so as to be readily detachable therefrom to permit access to the interior of the stem 11 when and if desired. The stem 11 with the bell 10 is arranged in any conventional manner for vertical reciprocation as by being slidably mounted in a stationary guide or bearing 15 and is vertically operated in proper operative timing by any convenient mechanism; the latter is exemplified by a rocking lever 16 having its preferably rounded end 17 located in a slot 18 formed in the cap or head 14 as shown in Figs. 1 and 2.

A pressure head 19 is located within the bell 10 and on its lower face is preferably provided with a resilient or otherwise yielding pressure pad 20 secured in place in any convenient manner. The pressure head 19 is carried by a plunger 21 and preferably is detachably connected therewith as by being threaded thereon, said plunger 21 being mounted in the stem 11 for slidable movement relatively thereto in operative synchronism with the associated elements of the apparatus. Any convenient mechanism may be provided for operating the plunger 21, said mechanism being exemplified by a rocking lever 22 projecting through an opening 23 in the stem 11 and having its rounded end 24 located in a slot 25 formed at the upper end of said plunger 21 as illustrated in Figs. 1 and 2.

The apparatus under discussion further includes means for maintaining the initially applied labels *a* against shifting out of position on the articles *b*. In the illustrated example, the aforesaid maintaining means comprises an auxiliary plunger 26 arranged to exert pressure on a restricted surface portion of the initially applied label *a* to maintain the latter against shifting on the article *b*. The auxiliary plunger 26 is carried by the plunger 21 and is slidably mounted in an axial bore 27 thereof and in an opening in the pressure head 19 and projects beyond the pressure pad 20 through an aperture therein. The auxiliary plunger 26 further extends length-

wise of a chamber 28 formed interiorly of said plunger 21 and is controlled by a spring 29 in the chamber 28; the spring 29 bears with its one end against the inner end of the chamber 28 and has its other end in engagement with an annular flange 30 on the auxiliary plunger 26. In addition to providing an abutment for one end of the spring 29, the annular flange 30 in cooperation with the pressure head 19 serves as a stop for arresting the outward movement of said auxiliary plunger 26 by the action of said spring 29 which yieldingly maintains said auxiliary plunger 26 in its normal extended position on the plunger 21 and returns it thereto. As shown in Figs. 1 and 2, the bell 10 is provided with a nipple 31 for the accommodation of a flexible tube 32 or the like, which serves to connect the interior of said bell 10 with a suitable pump or the like, whereby the air pressure in the bell 10 is reduced below atmospheric or a vacuum is produced therein.

The adhesive whereby the labels *a* are adhesively connected with the articles *b* may be applied to the surface of the article on which said labels *a* are to be located, or said adhesive may be applied as a coating to the backs or rear surfaces of the labels *a*. For purposes of description and for no other reason it will be assumed that the labels *a* are provided on the backs or rear surfaces with a coating *c* of suitable adhesive as shown in exaggerated form in Fig. 3. While this coating *c* of adhesive is in a tacky condition or after it has been moistened to bring said coating *c* to such condition, the label *a* is brought into initial adhesive connection with the article *b* in any convenient manner and in predetermined position thereon.

In such initial application, air pockets *d* are very likely to develop beneath the label *a* so that portions of the latter are not in surface connection with the article *b* but are spaced therefrom as illustrated in a greatly exaggerated manner in Fig. 3. During the aforesaid initial application of the label *a* to the article *b* the latter may be carried by a suitable support 33 which subsequent to said initial application may be operated in any conventional manner to shift the article *b* with the initially attached label *a* thereon into operative relation to the apparatus shown in Figs. 1 and 2.

By appropriate operation of the lever 16, the stem 11 is moved downwardly to correspondingly move the bell 10 until the gasket 13 thereof engages the surface of the article *b* and by engagement therewith under pressure establishes an air-tight union with said article *b*; at this stage the initially applied label *a* is covered by the bell 10, the interior of which constitutes an enclosure or chamber which is substantially air-tight in which said initially applied label *a* is located. In proper timing the lever 22 is actuated to shift the plunger 21 downwardly in the stem 11 to thereby bring the auxiliary plunger 26 into contact with the initially applied label *a*; as the movement of the plunger 21 continues, the auxiliary plunger 26 will move into the same against the tension of the spring 29 and thereby will exert pressure on a restricted surface portion of the initially applied label *a* to maintain the latter against shifting out of position on the article *b*. It will be understood, if desired, that the timing may be such that the plunger 21 is first operated to cause the auxiliary plunger 26 to develop its maintaining pressure on the initially applied label *a*, and that the bell 10 is subsequently moved into engagement with the article *b*, without effecting the operative results ultimately obtained by the apparatus.

In predetermined timing with the other steps of the label applying operation, suction is in any case developed within the bell 10 through the tube 32 and nipple 31 to reduce the air pressure interiorly of said bell 10 below atmospheric pressure and preferably to develop a vacuum therein. This removes the air in the air bubbles *d* from beneath the initially applied label *a* and accordingly causes the portions of the latter contiguous thereto to shift into surface engagement with the article *b*. By a continued operation of the lever 22, the plunger 21 is moved further down in the stem 11 and the pressure pad 20 of the pressure head 19 is thereby caused to exert a pressure upon the remaining surface portions of the label *a* to thereby complete the adhesive connection of said label *a* with the article *b*.

As the pressure of the auxiliary plunger 26 in the final label applying steps and the pressure of the pressure pad 20 are effective on the label *a* in the presence of air pressure less than atmospheric pressure, and preferably in a vacuum within the bell 10, the label *a* is firmly and adhesively fixed in place in the article *b* in a smooth and uniform manner. When the operation of adhesively applying the label *a* to the article *b* has been completed, air is admitted to the interior of the bell 10 through the tube 32 and nipple 31 to restore the air pressure therein to normal and to break the vacuum previously existing therein, after which the bell 10 and associated parts are raised to permit the removal of the article *b* with the fully applied label *a* thereon, after which the aforesaid operations may be repeated to apply a successive label *a* to a successive article *b*.

In many instances, the surface of the article *b* to which the label *a* is applied is uneven as exemplified in an exaggerated manner by the depression or dent *e* in Fig. 3. In such case, because of the fact that the final steps in the application of the label *a* to the article *b* are performed under reduced air pressure or in a vacuum, any air in such depression or dent *e* is removed from beneath the label *a* in the same way as from the air bubbles *d*. As a result when the air pressure in the bell 10 is restored to normal, the pressure thereof will force the label *a* into such depression or dent *e* into adhesive connection with the surface thereof; the same is true with respect to any other inequalities in the surface of the article *b*. In consequence of this, all parts of the label *a* throughout its entire area are firmly and adhesively connected with the article *b* and no parts of said label *a* remain disconnected from the surface thereof when the label applying operations are completed; this result is furthermore assured by the fact that the yielding pressure pad accommodates itself to the surface contour of the article *b* and because of the absence of air resistance beneath the label *a* easily forces all parts of the latter into uniform and uninterrupted adhesive connection with all parts of the surface of said article *b*.

This is of particular importance in connection with labels *a* of Cellophane, decalcomanias, ceramic decalcomanias and the like, and enables such labels, etc., to be readily and smoothly applied in an efficient manner to the articles for which they are intended.

The novel method is capable of being performed efficiently by relatively unskilled operators and the

novel apparatus requires no particularly skilled supervision in its operation.

With the novel method and apparatus, labels made of various materials, and particularly labels which because of the inherent characteristics of the materials of which they are made, are difficult to apply properly, may be adhesively attached to articles of glass, ceramic-ware and other substances in a uniformly efficient manner.

Various changes in the specific forms shown and described may be made within the scope of the claims without departing from the spirit of the invention.

I claim:

1. The method of applying labels to articles which consists in adhesively connecting said labels with the articles in the presence of air pressure less than atmospheric pressure.

2. The method of applying labels to articles which consists in pressing labels into adhesive connection with the articles in a vacuum.

3. The method of applying labels to articles which consists in bringing the labels into initial adhesive connection with the articles, and subsequently developing pressure on said labels in a vacuum to complete the adhesive application thereof to said articles.

4. The method of applying labels to articles which consists in bringing the labels into initial adhesive connection with the articles, maintaining said initially applied labels against shifting out of position on said articles, and developing pressure on said maintained labels in a vacuum to complete the adhesive application thereof to said articles.

5. The method of applying labels to articles which consists in bringing the labels into initial adhesive connection with the articles, exerting pressure on restricted surface portions of the initially applied labels to maintain the latter against shifting out of position on said articles, and applying pressure to the remaining surface portions of said labels in a vacuum to complete the adhesive application thereof to said articles.

6. In a labeling apparatus, means for providing a confined air pressure less than atmospheric pressure, and means for adhesively applying attaching labels to articles in said confined air pressure less than atmospheric pressure.

7. In a labeling apparatus, means for providing a confined vacuum, and means for adhesively applying attaching labels to articles in said vacuum.

8. In a labeling apparatus, means for supporting an article in label receiving position, means co-operating with said article to provide an air-tight chamber means for developing a vacuum in said chamber, and means operatively effective in said chamber for exerting pressure on a label in said vacuum to adhesively attach said label to said article.

9. In a labeling apparatus, means for supporting an article and a label initially applied thereto, means co-operating with said article to enclose said initially applied label in an air-tight chamber, means for developing a vacuum in said chamber, and means for maintaining said initially applied label against shifting out of position on said article and for exerting pressure on said label in said vacuum to complete the application of said label to said article.

10. In a labeling apparatus, means for supporting an article with a label in initial adhesive connection therewith, a bell, means for shifting said bell into contact with said article to provide an air-tight chamber enclosing said label therein, means for developing a vacuum in said chamber, a main plunger movable within said bell, an auxiliary spring controlled plunger carried by said main plunger and operatively effective in said chamber for exerting pressure on a restricted surface portion of said label to maintain the latter against shifting out of position on said article, a pressure head within said chamber carried by said main plunger, a resilient pressure pad mounted on said pressure head, and means for operating said main plunger to shift said pressure pad in said chamber into engagement with the remaining surface portions of said label under pressure to complete the application of said label to said article in said vacuum.

11. In a labeling apparatus, means for providing an air-tight chamber, means for developing a vacuum in said chamber, means for supporting an article in label receiving position in the presence of said vacuum, and means operatively effective in said chamber for exerting pressure on a label in said vacuum to adhesively attach said label to said article.

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