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MACHINE FOR APPLYING TRANSFERS

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Fig. 1.

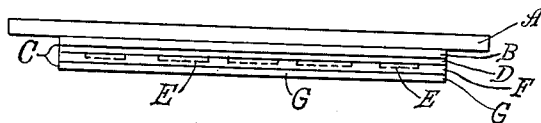
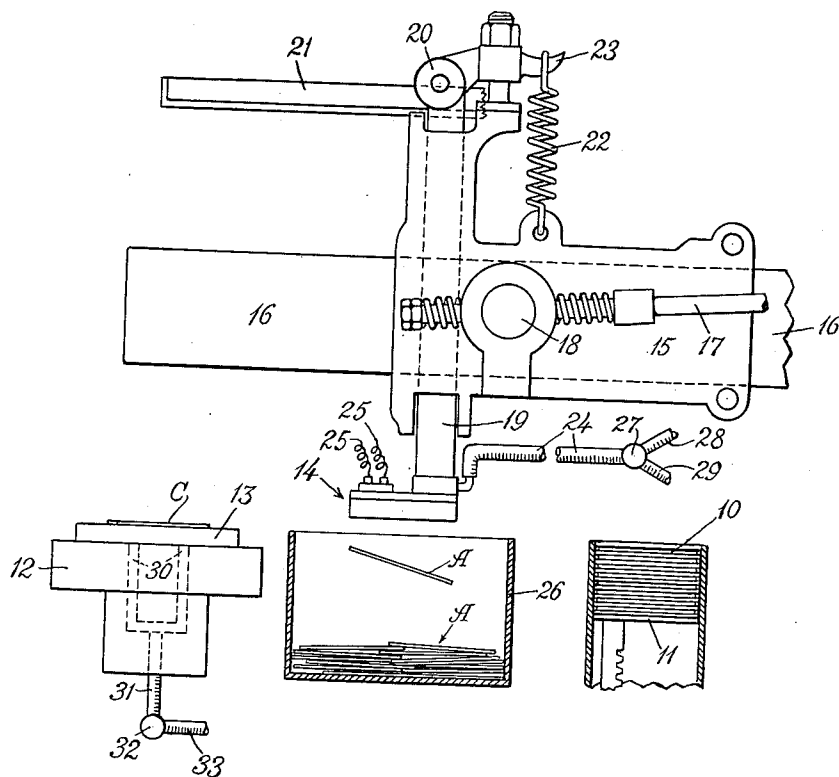


Fig. 2.



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MACHINE FOR APPLYING TRANSFERS

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This invention relates to labels and to the application thereof to articles.

An object of the invention is to provide an improved means for and method of applying to articles labels which are to be affixed thereto by a transfer printing operation.

Another object of the invention is to provide an improved transfer label whose construction will enable it to be satisfactorily and successfully utilized in a labeling machine embodying the invention.

Other objects of the invention, as well as the advantages and novel features thereof, will become more apparent after a perusal of the following description when read in connection with the accompanying drawings, in which Fig. 1 is an edge view of a label made in accordance with the invention, the label being shown with the paper layer thereof uppermost, which is the position it will have in the supply stack, and Fig. 2 is a diagrammatic view illustrating one manner in which the invention may be practiced.

Referring to Fig. 1 of the drawings, which for the purposes of illustration shows one method of construction for a label made in accordance with the invention, the letter A designates a base or carrier sheet for carrying the label. The sheet A may be in the form of a rolled strip or in separate sheets of suitable size, such as shown for example in Fig. 2 of the drawings. Sheet A may be made of any suitable material such as metal, paper and synthetic materials having relatively high melting temperatures, which will not adhere to the heated label carrying surface of the transfer device, and from which the label proper may be stripped by the adhesiveness of the adhesive coating on the label proper, all of which will hereinafter become more clear. Various types of paper may be employed in carrying out the invention such as for example, glassine and light cardboard, but I preferably use as the carrier sheet A an unsized paper of the character known in the trade as waterleaf. A waterleaf sheet which is very porous and absorbent is preferred. To the surface of the sheet is applied a coating B of material having a low melting point, such as wax or paraffin. The coating B should be applied to the base A so that it forms a continuous film over the area underlying the label proper on such sheet and may cover the entire area of the sheet. The coating material should be applied however, so that its depth of penetration into the base A is not complete and in such thickness of coating, that when melted by heat substantially the whole of such

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material will be absorbed into the base A and substantially disappear from the coated surface of the base A. While wax and paraffin have been given by way of example, it will be understood that the coating B may be composed of any substance which has a relatively low melting point and is readily absorbable by the absorbent material of the base A when melted so that it will no longer exist as a coating on the base. For the purposes of the invention therefore, any such substances are to be regarded as the equivalents of wax or paraffin.

The label proper is designated generally in Fig. 1 of the drawings by the letter C, and is constituted of a thin film composed of a layer D of heat resistant clear lacquer. On the layer D of lacquer the label is preferably made of inks which are heat resistant, the label printing being indicated in Fig. 1 of the drawings by the reference letter E. However, as will hereinafter appear more clear, the label printing E may be made of a thermo-activatable adhesive material having a substantially higher melting point than the material of layer B. Overlying the label printing E is a layer F of a heat resistant material such as clear lacquer, white paint or other material suitable as a background or protective coating for the label printing E. The outer layer G in the film C is a thermo-activatable adhesive material, such as a thermoplastic adhesive composition or other suitable material which is substantially unalterable and non-tacky at the temperatures and atmospheric conditions usually encountered during storage or at the place of use, but which when activated by heat will become usefully adhesive. The temperatures usually required for activating these adhesive films to an adhesive condition range from approximately 155° F. to 270° F. which are substantially above the melting point temperature of the material of layer B.

In the following description, the combined structure illustrated in Fig. 1 of the drawings and composed of the above described film C constituting the label proper, the absorbent carrier sheet A and the thermo-activatable releasable coating B of low melting temperature shall be referred to generally as the "label." Labels of this type are shown in Fig. 2 of the drawings formed into an upright stack 10 with the carrier sheets A thereof uppermost. The stack 10 is mounted on a support 11 to which is connected any conventional elevating means for raising the stack 10 of labels at periodic intervals to thereby restore the top label in the stack to a predeter-

mined height, and thus maintain the top labels at a substantially constant feeding level. The labels are fed from the stack or store thereof on the support 11 to a support 12 for the articles 13 to be labeled by means of a label carrier or transfer device of the suction-operated type which is designated generally in the drawings by the numeral 14. The label applying machine in which such supports and device are embodied, may be of any well known type and for the purposes of illustrating the invention, such parts have been shown as embodied in a labeling machine such as is described and illustrated in the von Hofe Patent No. 2,227,816, issued January 7, 1941.

In the machine of the aforesaid patent, there is provided a carriage 15 (note Fig. 2), slidably mounted on a horizontal guide rail 16 supported on the frame of the machine. The carriage 15 is reciprocated lengthwise of the rail 16 in predetermined time sequence by mechanism exemplified in Fig. 2 of the drawings, by the rod 17 which is pivotally connected at 18 to the carriage 15. A member or plunger 19 is slidably mounted on the carriage 15 and is vertically reciprocated thereon in properly timed relation with the associated parts by mechanism exemplified in Fig. 2 of the drawings by the roller 20 which is adapted to travel along a horizontally extending track 21 arranged to be raised and lowered to reciprocate the member 19. The downward movement of the member 19 may be facilitated by a vertically disposed spring 22 which is connected at its lower end to the carriage 15 and at its upper end to a lug 23 on the member 19. Secured to the lower end of the member 19 is the label carrier or transfer device 14.

It will be understood from the parts of the label machine thus far described, that when in the operation of the machine the transfer device 14 is in a position to pick up a label from the stack or store 10 of the labels, the track will be in a lowered position so that the label carrying surface of such device will be engaging with the uppermost label in the stack. The label carrying surface of device 14 is provided with a plurality of perforations or air vents which communicate with a chamber formed within such device. Such chamber is connected by means of a tube 24 with a source of suction through tube 28 and with a source of air pressure through tube 29. Properly timed valve means 27 of any suitable type is provided to control the air supply to the device 14 so as to provide a condition of suction in the chamber of the device and consequently at the label carrying or supporting surface thereof during a predetermined period of its cycle of movement and to deliver compressed air into such chamber at another predetermined period of the cycle of movement of such device. The valving means 27 is so timed that suction is affected at the label supporting surface of device 14 while it is positioned in lowered position above the stack 10 and until after the label film C carried thereby has been deposited on the article 13, as will hereinafter become more clear. When a label has been drawn from the stack 10 by the transfer device 14, the track 21 is raised to elevate the member 19 and consequently the device 14 with the label thereon. The carriage 15 is then caused to move to the left, as viewed in Fig. 2 of the drawings, to bring the device 14 over the article 13 which has previously been placed on the support 12 in label-receiving position. When the device 14 is in such position,

the track 21 is lowered and the member 19 moves downwardly on the carriage to thereby cause the transfer device 14 to press the label carried thereby against the surface of the article to which the label film C is to be applied.

The head or transfer device 14 carries a heating device composed of one or more electrical resistance elements which are mounted in such head and which are connected with a source of electricity by wires 25, 25. The resistance elements are preferably controlled by a thermostat mounted in such head to maintain the label supporting surface of the device 14 at a predetermined minimum temperature such as will adhesively activate the thermoplastic coating G on such label. It will thus be seen that during the travel of the transfer device 14 from the stack 10 to the article support 13, the label carried thereby is heated by the heating means in such device to adhesively activate the thermoplastic coating G on such label. Since the material of layer B is closer to the heated label carrying surface of the device 14 and has a much lower melting point than the temperature at which the material of layer G is activated, the material of layer B during such travel, will melt and will be readily absorbed by the porous absorbent paper layer A engaging the label carrying surface of the device 14 so that such material will practically disappear as a layer intermediate the paper layer A and the film C constituting the label proper. However, the adherence of film C to the paper layer A will be sufficient so that the two will be carried as a unit by the device 14 until the film C is deposited on the article 13. The material of coating B will become wholly absorbed and impregnated in the carrier sheet A during the application of the label film C to the article under the heat and pressure exerted by the device 14. After the film C is firmly pressed by the heated device 14 upon the surface of the article 13 and the device 14 starts to withdraw from the article, the adhering qualities of the layer G will cause such film to be stripped from the paper layer A which is retained on the label supporting surface of the device by the continued suction condition and carried away from the article. By such method, there can be handled labels in the form of very thin films which otherwise would be practically impossible to handle in a labeling mechanism.

Following the depositing of the film C on the article, the device 14 is lifted with respect to the carriage 15 by the action of track 21 on the roller 20 and member 19. The labeled article 13 is then removed from the support 12 and the carriage is retracted to bring the device 14 back into label receiving position over the stack of labels on support 11 to repeat the operations above described. In its travel back to such position the transfer device passes over the open end of a receptacle 26, during which portion of its travel the suction in such device is discontinued and in its stead, there is delivered compressed air into such device to blow the paper sheet A carried thereby into the receptacle 26.

In carrying out the above described sequence of operations, it will be understood that the valving means 27 controlling the air supply to the device 14 is timed to provide suction in such device when the label supporting surface thereof is coming into contact with a label on the support 11 to hold a label to such surface, and such suction is maintained during the travel of the device 14 to the support 12, during the attach-

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ment of the label film C to the article and until such device is over the receptacle 25 on its return to the support 11. At such time, the suction is discontinued and a blast of air delivered to the device 14 to remove the paper sheet A of the label that has been retained by the device 14. Following such blast of air, the air pressure in the chamber of the device 14 will be atmospheric until such device is moving toward the uppermost label on the support 11, whereupon suction will be provided in such device to enable it to pick up and carry such label in the manner above described.

The article carrying surface of the support 12 is provided with a plurality of perforations or air vents which communicate by means of passages 30 with an air line 31. The line 31 is connected with a source of suction through tube 33. Properly timed valve means 32 of any suitable type is provided to apply a condition of suction at the surface of support 12 while an article is positioned thereon, and until after the label film C has been applied to such article. Thus, the article is maintained in position while the paper layer A is being stripped from the film C without any possibility of movement of such article which might tend to affect the proper disconnection of the film from the paper layer.

While I have hereinabove described and illustrated in the accompanying drawing a preferred embodiment of my invention, it will be obvious to those skilled in the art that various changes and modifications may be made therein without departing from the spirit of the invention or the scope of the appended claims. Thus, the layer F of the label may be omitted and the thermo-activatable coating G applied directly to the printing E and layer D, or layers G and F may be omitted and the printing E made of thermoplastic adhesive material instead of printing inks, as has been previously indicated. When paper of the type of paraffin paper or other non-porous sheeting is used for the layer A instead of the porous, absorbent material above described, a film of the wax or paraffin will remain on the outer surface of the film C constituting the label proper when it is applied to the article and such wax film will be found to be desirable for certain purposes such as protection of the label against "weathering" and to enhance its appearance.

I claim:

1. In a machine for applying decalcomanias to separate successive articles at an applying station, means spaced from said applying station for holding a stack of heat sensitive decalcomanias, vacuum means for picking up a decalcomania from said stack and carrying such decalcomania to said applying station, means for applying heat to such heat sensitive decalcomania while the latter is carried by said vacuum means to the applying station, means for applying the transfer of such decalcomania to an article at said applying station and for applying positive pressure to the decalcomania during such application of the transfer thereof to the article, a discharge station, means for stripping the backing sheet of the decalcomania from the transfer thereof adhered to the article and carrying said backing sheet to said discharge station, and means for applying positive pressure to release the backing sheet at said discharge station.

2. In a machine for applying decalcomanias to separate successive articles at an applying station, means spaced from said applying station for

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holding a stack of heat sensitive decalcomanias, vacuum means for picking up a decalcomania from said stack and carrying such decalcomania to said applying station, means for applying heat to such heat sensitive decalcomania while the latter is carried by said vacuum means to the applying station, means for applying the transfer of such decalcomania to an article at said applying station, said applying means including said vacuum means, said heating means, and means for applying positive pressure to the decalcomania during such application of the transfer thereof, said vacuum means retaining a vacuum control of such decalcomania and said heating means heating said decalcomania during such application of the transfer thereof to the article, and means for separating the backing sheet of the decalcomania from the transfer thereof adhered to the article while said heat sensitive decalcomania is still in a heated condition.

3. In a machine for applying decalcomanias to separate successive articles at an applying station, means spaced from said applying station for holding a stack of heat sensitive decalcomanias, means for picking up a decalcomania from said stack and for carrying such decalcomania to said applying station, means for applying the transfer of such decalcomania to an article at said applying station, said last mentioned means including means for applying positive pressure to the decalcomania during such application of the transfer thereof and means for applying heat to the decalcomania during such application of the transfer thereof, and means for separating the backing sheet of the decalcomania from the transfer thereof adhered to the article while said heat sensitive decalcomania is still in a heated condition.

4. In a machine for applying decalcomanias to separate successive articles at an applying station, means spaced from said applying station for holding a stack of heat sensitive decalcomanias, vacuum means for picking up a decalcomania from said stack and carrying such decalcomania to said applying station, and means for applying the transfer of such decalcomania to an article at said applying station, said last mentioned means including said vacuum means and while the latter retains a vacuum control of such decalcomania during such application of the transfer thereof to the article, means for applying heat to the decalcomania during such application of the transfer thereof, and means for applying positive pressure to the decalcomania during such application of the transfer thereof and for separating the backing sheet of the decalcomania from the transfer thereof adhered to the article while said heat sensitive decalcomania is still in a heated condition.

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References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
1,882,593	Hentschel	Oct. 11, 1932
2,103,082	Lawrence	Dec. 21, 1937
2,111,897	McNutt	Mar. 22, 1938
2,190,405	Humphner	Feb. 13, 1940
2,231,262	Fridolph	Feb. 11, 1941
2,247,623	Von Hofe	July 1, 1941
2,300,185	Von Hofe	Oct. 27, 1942
2,353,352	Muir	July 11, 1944
2,501,539	Ruth	Mar. 21, 1950