

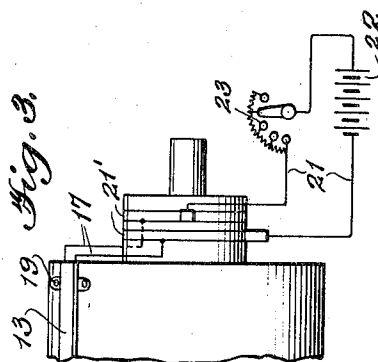
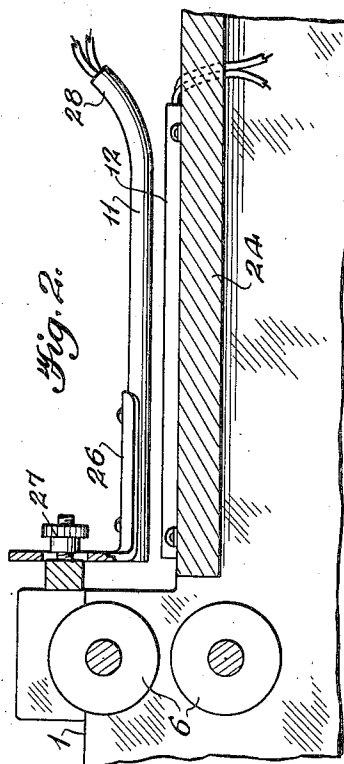
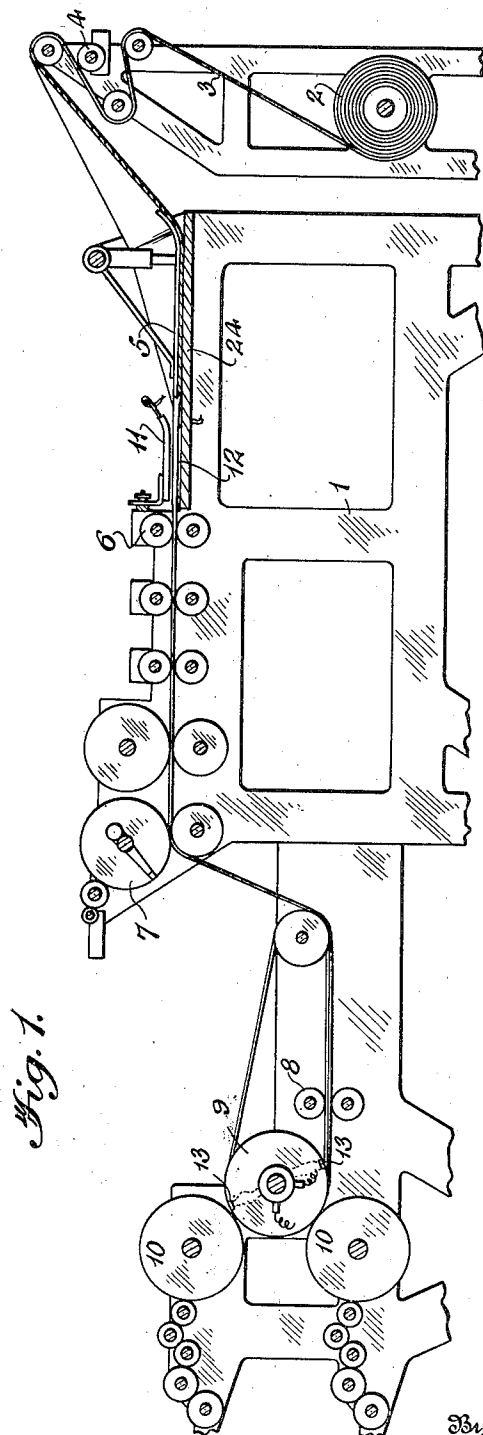
**Dec. 19, 1933.**

S. MOORE

**1,940,561**

# APPARATUS FOR UNITING WAX PAPER

Original Filed March 16, 1932      2 Sheets-Sheet 1



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Dec. 19, 1933.

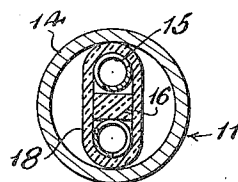
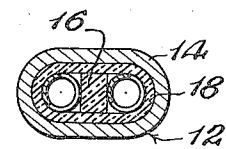
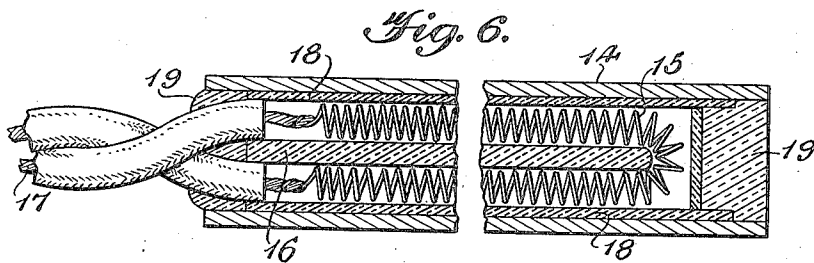
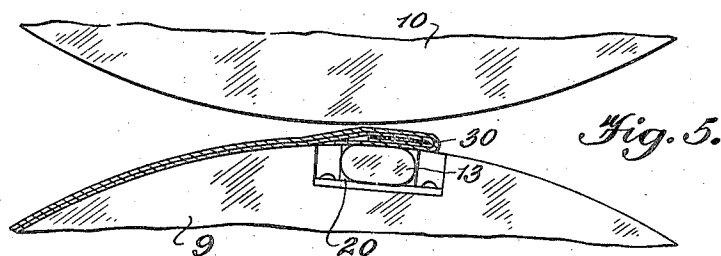
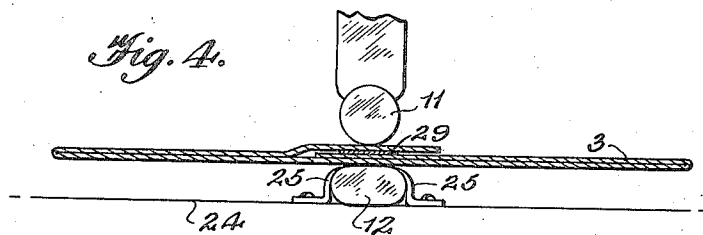
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APPARATUS FOR UNITING WAX PAPER

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2 Sheets-Sheet 2



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## UNITED STATES PATENT OFFICE

1,940,561

## APPARATUS FOR UNITING WAX PAPER

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Original application March 16, 1932, Serial No. 599,323. Divided and this application October 11, 1932. Serial No. 637,313

5 Claims. (Cl. 93—20)

The present invention relates to paper bag making machines, and more particularly, to means for uniting wax fabrics used in the manufacture of the bags. This application is a division of my co-pending application, Serial Number 599,323, filed March 16th, 1932.

Among the primary objects of the present invention is to provide an apparatus capable of being readily installed and presented for use upon an ordinary bag making machine, whereby when a web of wax coated paper passes through such machine, heat will be supplied to the seams or edges of the paper to be connected together, at the proper temperature and for the proper length of time, in order that the wax upon such paper will be permitted to flow into contact with the paper, the cells or pores of the paper will be caused to expand whereby the adhesive will be permitted to be more freely absorbed by the fibers of the paper, the adhesive caused to be more quickly set and when the heat is withdrawn from the paper, the wax so melted will be permitted to congeal about the seam or edges of the paper so connected together, whereby a moistureproof seal about such connection will be established.

Other objects of the invention will be in part obvious and in part pointed out hereinafter.

In order that the invention and its mode of operation may be readily understood by persons skilled in the art, I have in the accompanying illustrative drawings and in the detailed following description based thereon, set out several possible embodiments of the same.

In these drawings:

Figure 1 is a fragmentary view in vertical section of a conventional type of bag making machine, illustrating how the apparatus for carrying out my invention may be installed therein;

Figure 2 is an enlarged detail section of the same bag making machine showing in side elevation the heaters for effecting a seal between the longitudinal edges of a web of paper after the latter has been formed into a flat tube;

Figure 3 is a detail elevation of a tympan or packing cylinder of the bag making machine showing another form of heater applied thereto and its connection with a suitable source of electrical energy, which latter has been diagrammatically shown;

Figure 4 is an end elevation of the heaters as illustrated in Figure 2 with the flat tube of waxed paper passing therebetween;

Figure 5 is an enlarged detail end elevation

of the packing cylinder and an adjacent plate cylinder of the printing mechanism showing, in end elevation, one of the heaters arranged within the packing cylinder and the path of travel of the paper bags between the cylinders;

Figure 6 is an enlarged longitudinal section through one of the flat heaters;

Figure 7 is a transverse section through the same; and

Figure 8 is a vertical transverse section through the upper adjustable heater as better shown in Figures 2 and 4 of the drawings.

In the accompanying drawings wherein like corresponding parts are designated by similar reference characters throughout the several views, I have shown a conventional type of bag making machine comprising a frame 1 supporting at one end thereof, a roll 2 of paper from which the bags are formed. The web 3 of paper from this roll, and which is to be formed into bags, passes over the usual paste supplying roll 4 whereby the paste is applied to one of the longitudinal edges of this web of paper. This web 3 progresses about a suitable forming element 5 and thence to the bite of a pair of feed rolls 6 which are effective to advance the web and ensure its progressive folding into a flat tube from the forming element 5. The pasted edge, when the web is folded, overlaps the adjacent folded edge of the web and affords a longitudinal seam for the tube, as usual. The paper tube so formed, after passing through the usual feed and catch rolls, comes in contact with the usual serving device, which latter severs the tube in bag lengths in a successive manner. The roll 7 supplies paste to the margin of the leading end of each succeeding tube or bag section so severed. Each bag section, now having the longitudinal seam properly sealed and having a streak of paste along the leading end thereof, is fed to the usual conveyor 8 where the forward end of each tube is folded over and subsequently fed between the packing cylinder 9 and the plate cylinders 10 of the usual printing mechanism associated with the bag making machine, whereupon the face of each bag may have the required printed matter thereupon. Each bag so formed and printed is then delivered to the upper part of the conveyor 8 and finally discharged in its completed form to one side of the bag making machine. The foregoing briefly describes the method of forming bags from an ordinary paper bag making machine now extensively used, and the same forms no part of the present invention.

In carrying out my invention, I have found that by the proper application of heat without the use of pressure to the edges or seams of paper previously waxed or coated with a moistureproof material, may be readily united and a sufficiently strong seal or bond established that will permit the bags so formed to be employed for general use. Such waxed coated paper should be substituted for the roll 2 of the ordinary uncoated paper and the web of wax coated paper is first supplied with a suitable paste or adhesive along its longitudinal edges by means of the paste applying roll indicated by the numeral 4 upon the drawings. The tube so formed with the adhesive thereupon passes between the heaters 11 and 12 whereupon the wax or other coating upon the paper is first melted to liquid form and the glue placed thereupon permitted to flow into contact with the paper. By the continual and simultaneous application of heat, the cells or pores of the paper have a tendency to expand whereupon the adhesive can be more readily absorbed by the fibers thereof especially in the absence of pressure and thus enhance the strength of adherence. The heaters 11 and 12 being relatively long permit of the application of heat to the paper for a relatively long period of time, whereupon by this continual application of heat to the adhesive, the moisture contained in the latter is more readily evaporated and the adhesive permitted to set in a relatively short period of time. As the web of paper progresses beyond the heaters 11 and 12, it will readily begin to cool, whereupon the wax so melted about the bond or seal made will congeal, thereby effecting a moistureproof seal about the connected edges of the paper. In order to effect a similar seal between one of the open ends of each bag section and permit of the proper application of heat, I preferably mount within the outer periphery of the packing cylinder 9, the heaters 13. Each one of these heaters 13 is so arranged and the packing cylinder so timed that a heater 13 will come in contact with that end of the bag to be sealed and stays in contact with such end of the bag until the packing cylinder has made one-half of a complete revolution, which is of sufficient time to permit first of the melting of the wax at that point of the bag to which the second or end seal is to be effected, permitting the paste which has been applied to that end of the bag by the paste applying apparatus 7 to come in contact with the paper and subsequently, by the continual application of heat to the paper, the pores thereof will expand or the fibers thereof separated in order that the adhesive will be more readily absorbed and as the paper bag so formed leaves the packing cylinder, it will be permitted to cool whereupon the wax which has been previously melted, will congeal so as to establish a moistureproof coating about the seal so made. By applying heat and without applying pressure to the wax coated papers as they pass between the heaters 11 and 12 or in contact with the heater 13 in the manner aforesaid, I have found that a truly moistureproof bag is formed with sealed joints of greater strength than that of the paper so employed in the making of the bags.

Whereas the heaters as shown in the accompanying drawings are supplied with electrical energy, it is, of course, to be understood that heat derived from gas, chemicals, steam, heated water, or other liquids, may be used. While the

degree or intensity of heat necessary to effect uniting or sealing varies with the amount of wax or other coating material which has been applied to the paper from which the bags are formed, the requisite and proper intensity may be secured by any common or well known method of controlling the electrical current or other heating medium. These heaters are each formed from a tube 14 preferably made from copper. The length and width, together with the thickness of the tube, may be varied to meet the particular requirements of the type of bag to be manufactured, or the type of bag making machine used, as well as the heating element employed. Positioned within the tube 14 is a resistance coil 15 which is bent upon itself, the two sections thus formed are separated by an asbestos partition 16 and the electrical energy is supplied to this element 15 through the conductors 17. Surrounding this element 15 and positioned within each tube, is an envelope of asbestos 18, whereas the opposite ends of the tube are closed by suitable sealing material 19. The heaters 13 are of the same outer contour as the heater 12 and these heaters 13 are each fastened within a suitable transversely extending channel or recess 20 formed within the outer periphery of the packing cylinder 9. The heaters 13, as illustrated in Figure 1 of the drawings, are arranged diametrically opposite within the outer periphery of the packing cylinder 9 so that when the cylinder is revolved, one heater contacts the bottom fold or seam of the bag, the heat therefrom penetrates and heats the adhesive which has been previously applied to the edges of the paper enabling it to perform the uniting and sealing operation. For certain types of bag making machines, this operation is completed on two bags simultaneously and in order to accommodate this simultaneous operation, two heaters are herein shown.

In Figure 3 of the drawings, I have shown the conductors 17 which lead to the heater 13 as being in contact with the conductor rings 21' secured upon an extension of the cylinder 9 and these conductor rings 21' are electrically connected by means of the conductors 21 to a suitable source of electrical energy herein indicated by the numeral 22. Electrically arranged within the conductors 21 is a rheostat 23 or other suitable control, whereby the flow of current to the element within the heater 13 may be controlled so that the proper temperature may be automatically or manually maintained.

The heater 12 is supported upon the bed plate 24 of the bag making machine and held in proper position by means of the clamps 25. The upper heater 11 has secured to one end thereof, a bracket 26 and this bracket 26 is adjustably connected by means of the set screw 27 to the frame 1 of the bag making machine, whereas the opposite end of this heater 11 is curved or bent upwardly as at 28. The bent or free end 28 of this heater 11 permits the web of paper which is to be formed into bags to readily pass between the heaters 11 and 12 and the vertical adjustment of this heater 11 may be readily established in order to cause the same to be retained in proper position above the seams of the paper web, which are to be sealed together.

The web of paper, as it leaves the former 5 is folded upon itself in the shape of a tube, as is better illustrated in Figure 4 of the drawings, and the overlapping longitudinal edges of the paper form a seam which is to be secured to-

gether with means of the adhesive 29. This adhesive has been applied to the paper as it passes over the paste supplying roll 4 and the paper tube, together with the seam so formed, passes  
5 between the heaters 11 and 12 in order that the heat will be applied directly to the opposite sides of the paper at a restricted longitudinal area or zone. This seam or area to be sealed or united  
10 travels the full length of the heaters 11 and 12 in order that the heat will first melt or liquefy the wax coating upon the paper, and as the paper progresses between these heaters, the uniting and sealing operation heretofore described, will be completed. As the folded over end 30 of  
15 each bag section illustrated in Figure 5 comes in contact with a heater 13, the heat so generated will perform a similar action upon this end of the bag to be sealed, as when the longitudinal seam passes between the heaters 11 and 12 in  
20 order, at this point or end of the bag, the proper sealing and uniting will be effected. That portion of the paper having the adhesive thereon as it comes in contact with the heaters 11, 12 or 13 is not subjected to pressure as is apparent  
25 from Figures 4 and 5 of the drawings, nor is pressure desired during either sealing operation. The application of the invention heretofore described is not limited to bags in which the opposite edges thereof consist of a single fold, or in  
30 which one end is folded onto an adjoining portion of the bag structure to close the same, but may be employed in the manufacture of bags of any other of the known types of structures. For example, the invention may be employed to  
35 manufacture a bag wherein the opposite edges thereof consist of two or more pleats or folds, and also may be employed in the manufacture of bags in which the bottom and top ends thereof are or may be closed, in an altogether different  
40 manner from that described, by the application of heat to the adhesive and paper at the proper and necessary point of adherence. It is also to be understood that the method and apparatus herein shown and described are not limited  
45 for use in connection with paper bag making but the same may be employed for uniting any paper or fabric having an adhesive repellant coating thereupon.

Manifestly, the construction herein shown is  
50 capable of considerable modification and such modifications as come within the scope of my

claims, I consider within the spirit of my invention.

I claim:—

1. The combination with a paper bag making machine having means for overlapping the longitudinal edges of the paper, a heater mounted upon the paper bag making machine, and said heater extending longitudinally with the overlapping edges of the paper and disposed to merely touch the same whereby the overlapping edges of the paper may be united without the application of pressure. 80 85

2. The combination with a paper bag making machine having means for overlapping the edges of the paper as it passes through the machine, of heaters supported by said machine and said heaters being arranged on the opposite side of the overlapping edges of the paper as the latter passes through the machine. 90

3. The combination with a paper bag making machine having means for overlapping the edges of the paper as it passes through said machine, of a heater fixedly mounted upon said machine and extending within the path of travel of the overlapping edges of the paper passing therethrough, and a heater adjustably mounted upon said machine at a point above said fixed heater. 95 100

4. The combination with a paper bag making machine having means for overlapping the edges of the paper as the latter passes through the machine, of a heater fixedly mounted upon said machine and adapted to contact with one side of the overlapping edges of the paper, and a heater adjustably mounted upon said machine and adapted to contact with the opposite sides of the overlapping edges of the paper. 105 110

5. The combination with a wax paper bag making machine having means for overlapping the edges of the paper as the latter passes through the machine, of a heater for causing the overlapping edges of waxed paper to be united together comprising a relatively long tube, a heating element within said tube, and said tube being arranged upon the machine to extend in a longitudinal direction with the overlapping edges of the waxed paper and disposed to merely touch the same whereby said overlapping edges of the paper may be united without the application of pressure. 115 120 125

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