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H. F. WATERS

2,125,758

MACHINE FOR MANUFACTURING BAGS

Filed May 8, 1935

Fig. 1.

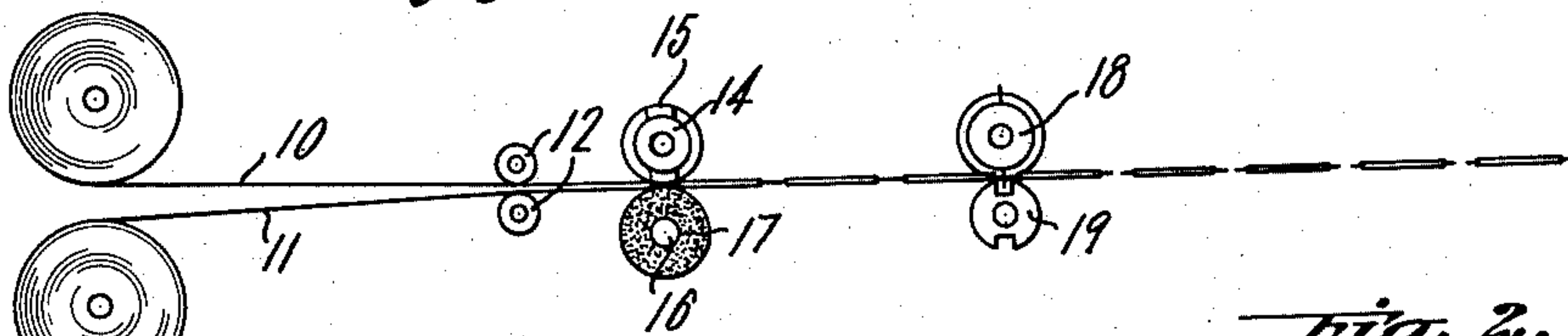


Fig. 2.

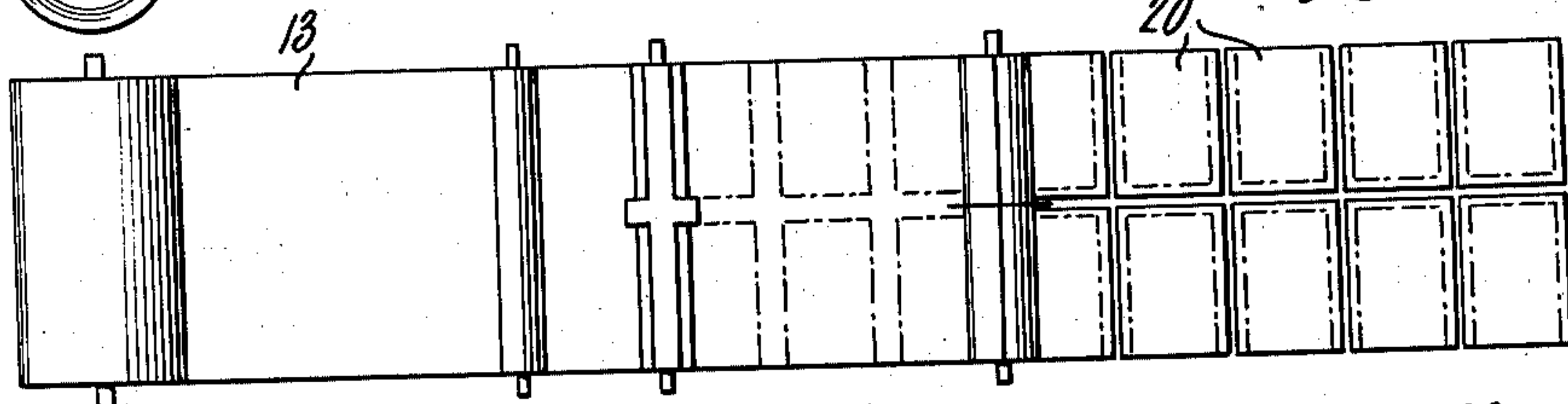


Fig. 5.

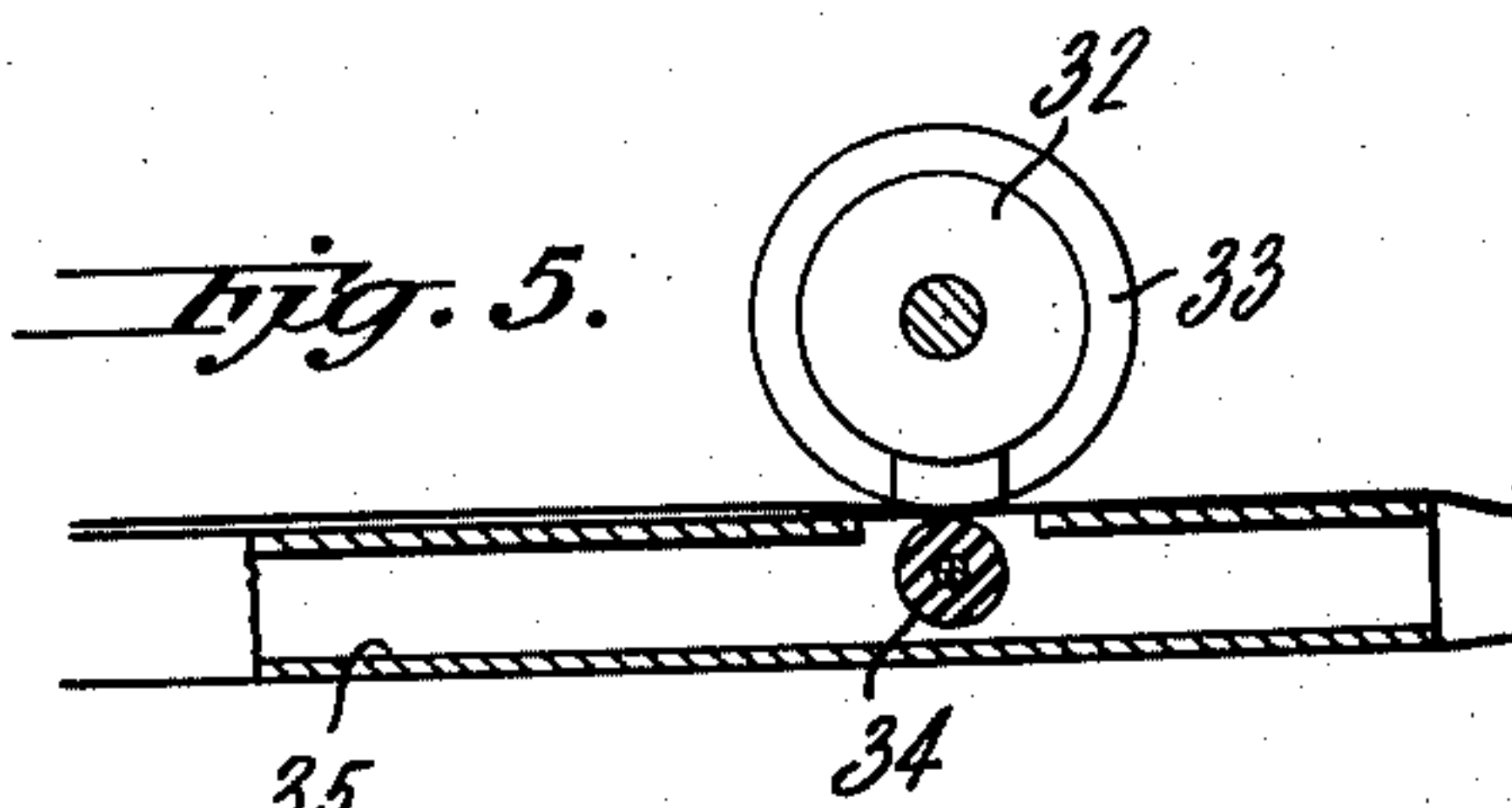


Fig. 3.

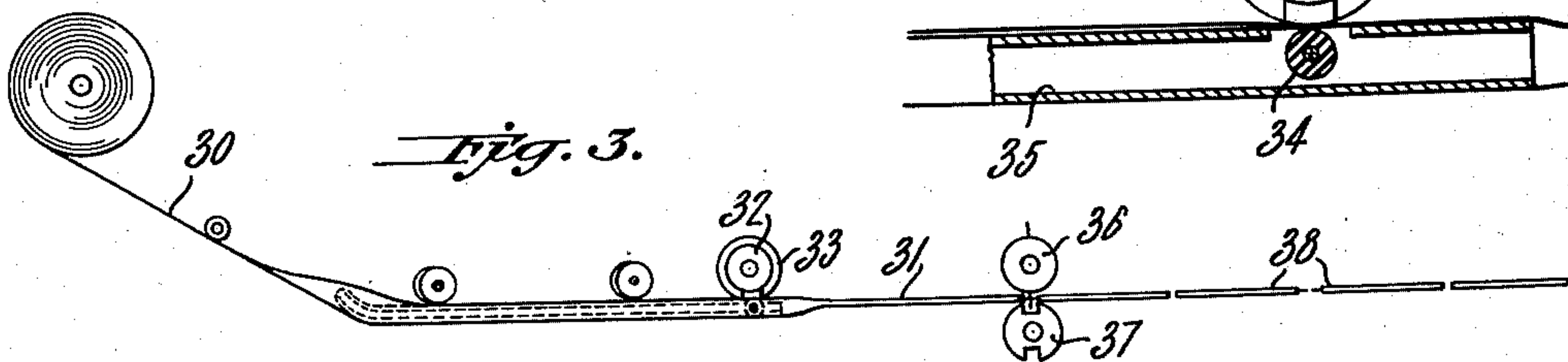


Fig. 4.

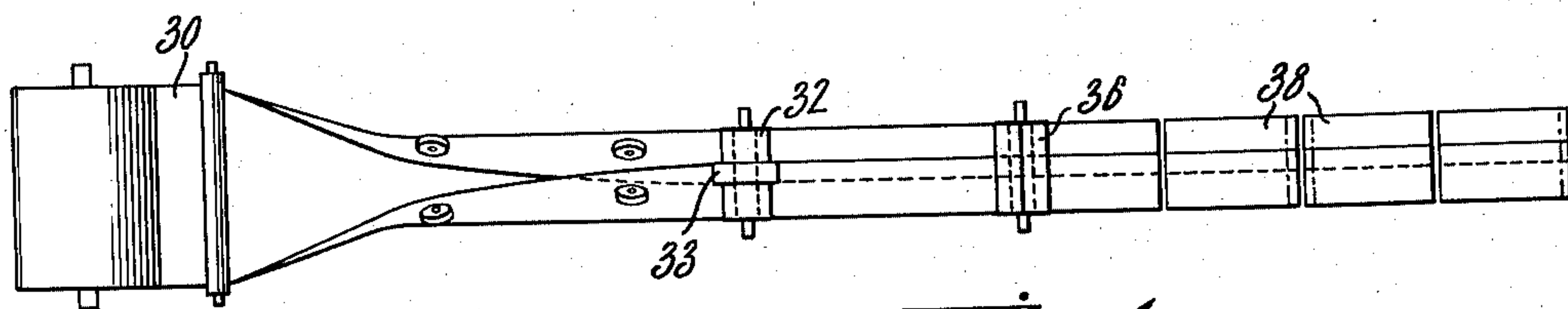


Fig. 6.

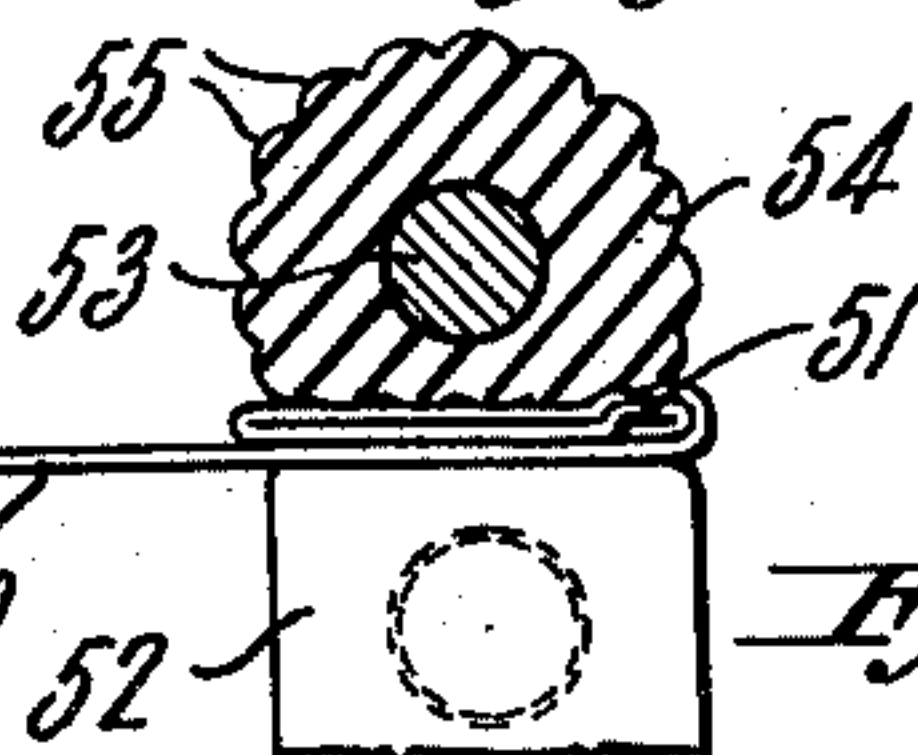


Fig. 7.

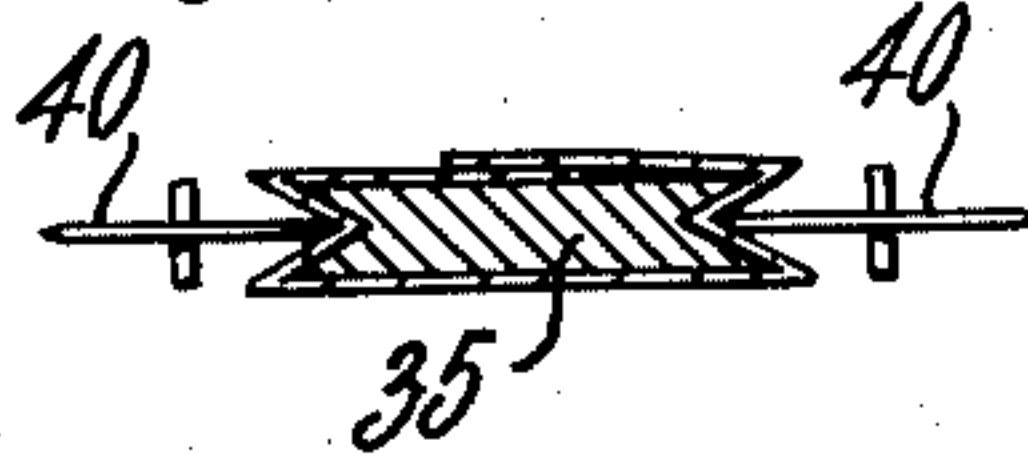


Fig. 8.



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MACHINE FOR MANUFACTURING BAGS

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Application May 8, 1935, Serial No. 20,370

7 Claims. (Cl. 93—20)

My present invention relates to improvements in the manufacture of bags and like containers and more particularly to an improved apparatus for making sift-proof, air-tight and liquid resistant containers.

In the art of manufacturing bags and the like according to standard practices a web of material is first formed into a tube having overlapped edges and forming in the finished bag a longitudinal seam. To secure these overlapping edges together adhesive is supplied to one of the edges prior to the tube formation by means of a roll or other adhesive applying device. Thereafter the bag tube is cut off into the desired lengths and the bottom of the bag is then formed in a manner well known in the art. Either prior to or during the formation of the bottom, lines of adhesive are applied at the desired points so as to secure the various parts of the bottom in place. The bags, made according to standard practices, depend for their efficiency and successful performance as to sift-proofness on the ability of the manufacturer properly to apply the adhesive to the bag seams and bottom. Since various forms of material are used in making bags the effectiveness of the adhesive has been found to depend primarily upon the material from which the bag is made. Thus bags made from kraft paper present no difficulties in satisfactorily securing the overlapped portions of the bag together. However, when waxed, paraffin or similar paper is used, the coating of the paper precludes, in many instances, the successful adhesion of the overlapped portions of the bag together. Particularly is this true when use is made of rubber-like materials, as for example that type of material known in the trade as "pliofilm", or rubber coated or latex coated paper. It has heretofore been considered impossible satisfactorily to secure by ordinary adhesive means the bag sections together. Thus in forming the longitudinal seam of the bag, it has been found that no real adhesion will take place so that when the bag is to be used for packaging sifting goods, such as powdered milk and the like, or when it is to be used as a package for liquids, such as oil, the seam will part thereby destroying any utility which the bag might have originally possessed.

Accordingly, a primary object of my present invention is to provide a new apparatus for the manufacture of sift-proof, air-tight and liquid-proof bags and like containers wherein the seams of the bag formed by overlapped edges of the material from which the bag is made are secured together by heat. Another object of my invention is to provide a new machine for form-

ing bags and similar containers wherein when the material from which the bag is to be made is brought into tube form the overlapped edges are passed between heat sealing members which will form a substantially unbreakable longitudinal seam.

Another object of my present invention is to provide a new apparatus for the manufacture of bags wherein use is made of waxed, greased, paraffin papers, Pliofilm, rubber or rubber coated materials wherein two plies of material, after being brought into superimposed relation, are passed between heating rollers which will form longitudinal and transverse seal areas in the material. The material is then passed between cutoff rolls which sever the material through the sealed areas, thereby producing a bag or container sealed along three edges and open at the remaining edge.

A feature of my invention resides in the provision of a heat sealing device for securing together overlapped edges of material wherein the device comprises essentially two elements, one heat sealing element and the other a backing roll or member made of resilient material, as for example rubber. By the provision of such backing member, a perfect seal is insured in spite of variations in the manner in which the edges are overlapped due primarily to the fact that the resilient backing roll will exert a constant pressure on the overlapped area to force this area firmly against the heat applying roll.

These and other objects of my present invention will become more apparent from a study of the following description taken in connection with the accompanying drawing in which like numerals refer to like parts throughout.

Referring to the drawing:

Fig. 1 diagrammatically illustrates my invention in use in a certain type of bag making machine;

Fig. 2 is a plan view thereof;

Fig. 3 is a further diagrammatic showing of the invention in use in a different type of bag making machine;

Fig. 4 is a plan view thereof;

Fig. 5 is a partial cross-sectional view on an enlarged scale of the form of Figs. 3 and 4;

Fig. 6 represents a slightly different type of bag which may be formed on the machine of Figs. 3 and 4;

Fig. 7 represents a slightly different type of bag which may be formed; and

Fig. 8 represents my invention in use in a bottoming device.

In Figs. 1 and 2 there is set forth the essential portions of a well known type of bag or envelope forming machine in which a strip of material 10 and a strip of material 11 are superimposed and passed between feed rolls 12. Either strip may comprise fusible material or may comprise a sheet of base material coated with a fusible substance, or may be preprinted in defined areas with strips 13 of fusible substance. A roll 14 having heated sealing projections 15 thereon presses the combined webs against a backing roll 16. If the entire adjacent surfaces of the webs are fusible it will be apparent that wherever the heated portions contact the webs there will be formed cemented areas. If preprinted strips are in use the heating areas 15 must register with these strips. The backing roll 16 is formed, in accordance with my invention, with a covering 17 of yielding and heat-resisting rubber. I have discovered that a firm, absolute bond may best be obtained against a backing roll of this type as distinguished from the ordinary unyielding roll. The combined webs are then led between a cutting roll 18 and an anvil roll 19, the blades on the cutting roll separating the webs into bags or envelopes 20. It will be apparent that by placing the cuts within each fused or cemented area, each bag will be joined along three edges. The open mouths of the bags, while having fusible substance thereat, will not be sealed, but may be sealed after the bags are filled by the application of heat, perhaps in accordance with the invention disclosed in my co-pending application, Serial No. 20,371, filed concurrently herewith.

In Figs. 3, 4 and 5 there is schematically represented a type of bag-making machine wherein a sheet of material 30 is formed into a continuous tube 31 by means of a heating roll 32 having a raised heating area 33 bearing against a backing roll 34, formed in accordance with my invention. The backing roll 34 is placed within the former 35 in order that the two walls of the bag may not be sealed together. The bags are separated, by a shearing roll 36 and an anvil roll 37, into bags 38. It is apparent that the separation may take place at the center of the transverse cemented areas so that open bags will result as illustrated in Fig. 4. It is also apparent that the cuts may be placed adjacent one edge of the cemented areas so as to form open bags of a different character as illustrated in Fig. 6. It is also apparent that the bags may be gusseted before the sealing occurs by means of tuck-in rolls 40 operating upon the bag as it passes over the former 35, as illustrated in Fig. 7.

In Fig. 8 I have illustrated my invention embodied in a bottomer of any well known type. In such a bottomer an open-ended tubular blank may have adhesive applied in any well known manner, or the bags of Fig. 4, or Fig. 6 may be strengthened by the application of adhesive thereto, or by further fusing of folded portions thereof. It will be appreciated that any type of bottomer may be used, the present invention comprising a single element of a device to grasp and seal a blank previously bottomed. The bag length 50 is represented as having been folded upon itself as at 51 and gripped between a heated element 52 and a backing bar made in accordance with my invention. The backing bar comprises a rigid rod 53 surrounded by a rubber tube 54, such as a piece of rubber "steam-tubing". The surface of the rubber is preferably ribbed as at 55

in order that ribs will be formed in the sealed bottom, thereby strengthening the same. It will be noted that considerable pressure may be used during the application of heat, the pressure deforming the rubber covering on the backing bar, but nevertheless allowing the even application of pressure throughout the sealed area.

While I have specifically mentioned rubber as a preferred covering on the backing rolls and backing bar, it will be appreciated that other resilient yielding and heat resisting substances may be used. However, it is very easy to obtain certain types of rubber and rubber tubing which have the desired characteristics.

I claim:

1. A backing member for a heat sealing element in a bag making machine comprising a rigid member having a resilient covering, the surface of said resilient covering being ribbed.
2. A heat sealing device for a bag making machine comprising a heated element and a backing member, said member consisting of a rigid bar having a covering of a heat-resistant, resilient substance having a ribbed surface.
3. In a device for adhering material together by the application of heat comprising in combination a heated element having a substantially rigid working face, a backing member having a resilient working face whereby to force the said material against the working face of the heated element at substantially uniform pressure throughout the area of the surfaces to be adhered to each other.
4. In a bag making machine, means to adhere overlapping surfaces of material together comprising in combination, a heat sealing element, a backing member cooperating with said heat sealing element provided with a resilient working face whereby to force said overlapping surfaces of material to be sealed under uniform pressure against said heat sealing element.
5. In a bag making machine, means to adhere overlapping surfaces of material together comprising in combination, a heat sealing element, a backing member cooperating with said heat sealing element provided with a rubber covering capable of resisting high temperatures.
6. In a bag making machine, a former plate, means to fold a strip of material over said former plate whereby to form a tube provided with a longitudinal seam comprising overlapped edges of said material, means to adhere said overlapped edges together comprising a heat sealing element, a backing member provided with a resilient working face cooperating therewith to force said seam into engagement with said heat sealing element under uniform pressure.
7. In a bag machine of the class described provided with a former plate adapted to form a tube from a strip of material and means to cut said tube into predetermined lengths, means to close one end of each length of tube comprising a heat sealing element, a backing member having a resilient working face cooperating therewith to force one end of each tube against the heat sealing member, the resiliency of said backing member being such as to press said end against the heat sealing member under uniform pressure throughout the area to be sealed despite local variations in the thickness of the material to be secured together.

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