Dec. 12, 1933. A. POTDEVIN 1,938,859

BAG MAKING MACHINE

Filed Oct. 31, 1928 2 Sheets-Sheet 1

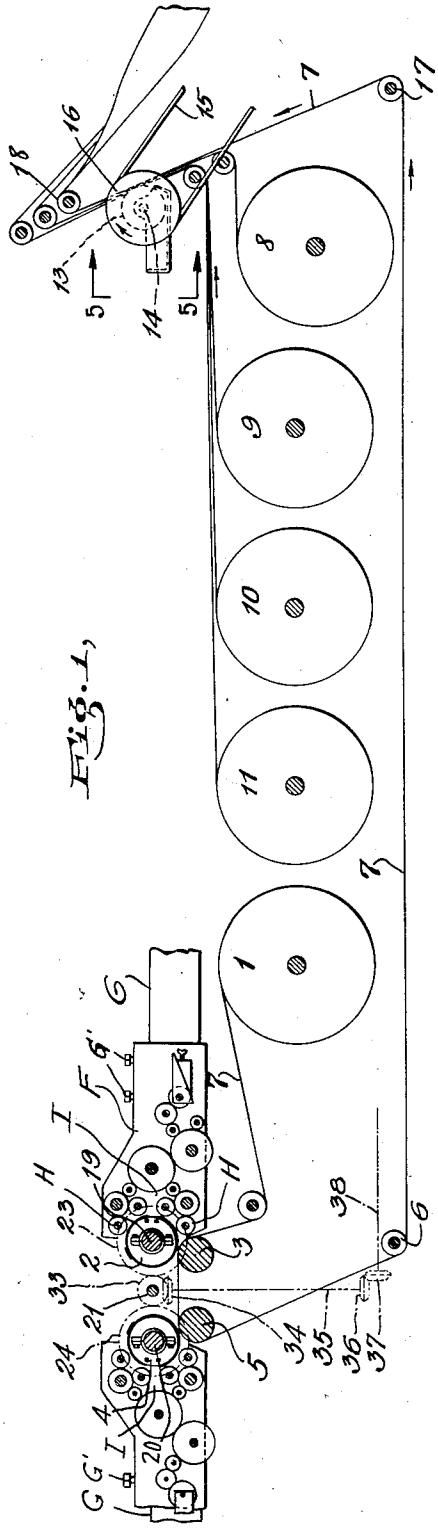


Fig. 1.

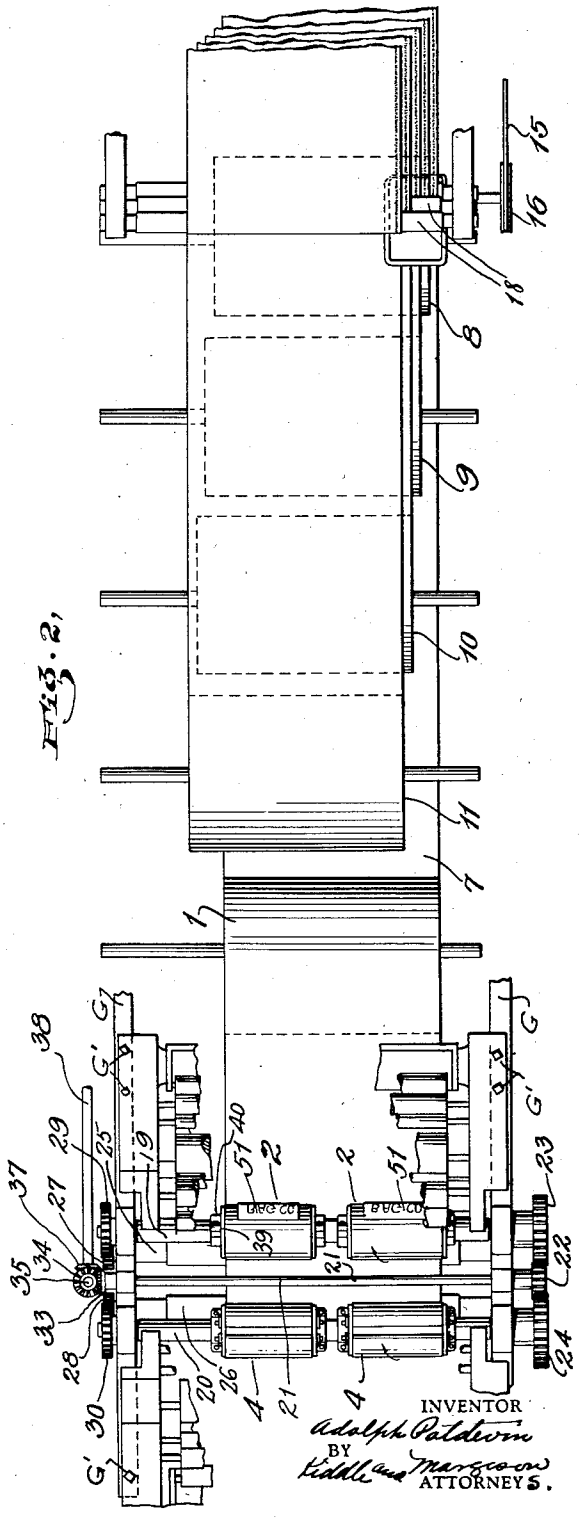


Fig. 2.

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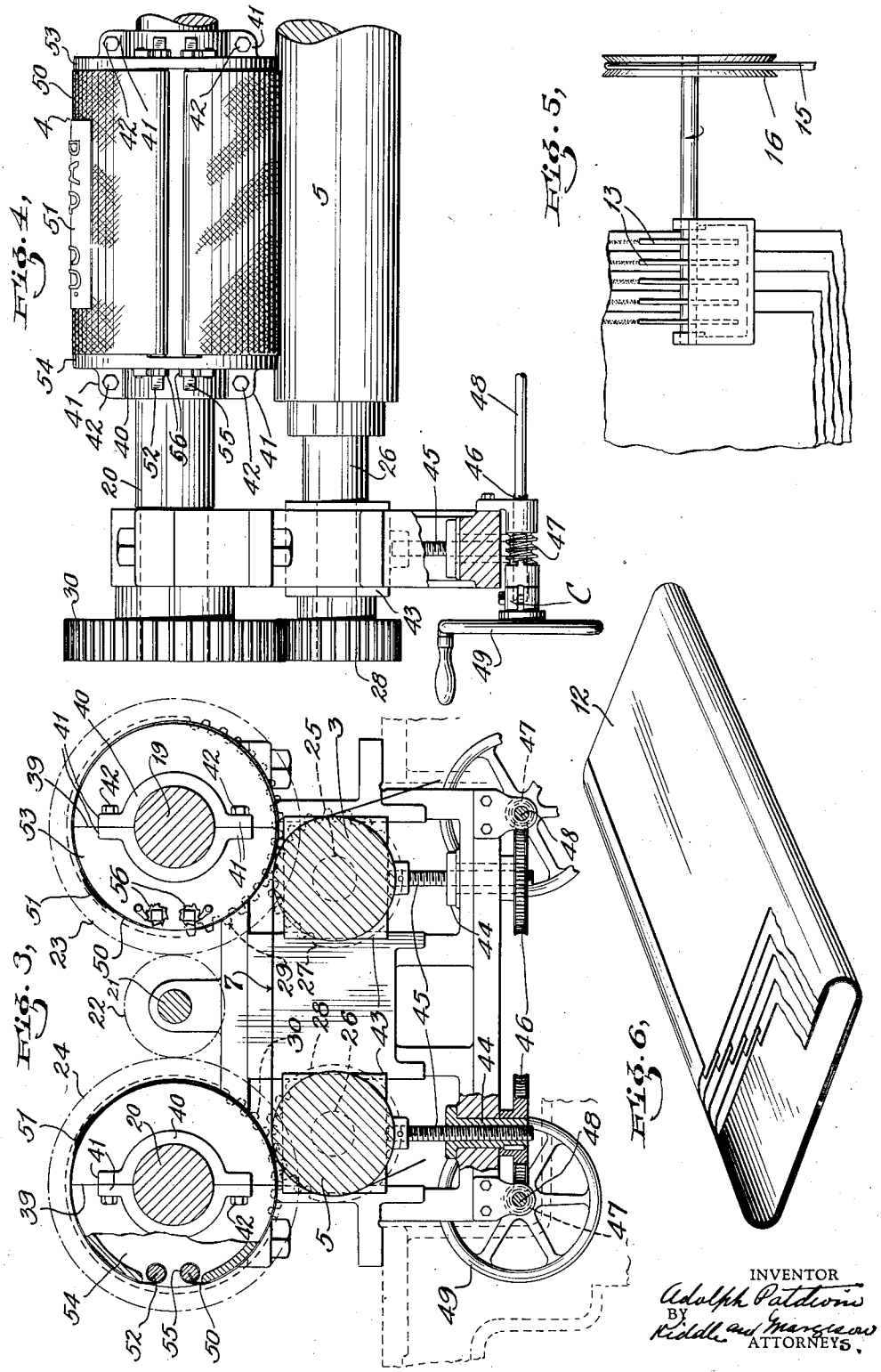


Fig. 3,

Fig. 4,

Fig. 5,

Fig. 6,

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1,938,859

BAG MAKING MACHINE

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Application October 31, 1928. Serial No. 316,195

3 Claims. (Cl. 101—181)

This invention relates to an improvement in paper bag machines, has for one of its objects the provision of an improved and novel construction so far as the printing mechanism is concerned, the driving apparatus for the printing mechanism, and the construction and arrangement of the inking rollers, all of which will appear hereinafter.

My invention has for a further object the provision of a paper bag machine so constructed and arranged that the printing after being applied to the paper web, is given time to dry before the web must go through the next operation in the making of bags.

A still further object of the invention is the provision in a machine for making multi-wall bags of an improved and novel mechanism for applying adhesive to the paper web before the seaming or tubing operation.

Other objects will appear hereinafter.

In the accompanying drawings Figure 1 is a more or less diagrammatic view in part sectional elevation of a bag making machine or a portion of a bag making machine embodying my invention.

Figure 2 is a plan view thereof.

Figure 3 is an end view partly in section of the printing mechanism.

Figure 4 is a view in elevation of the mechanism of Figure 3, the view being taken at right angles to the showing of Figure 3.

Figure 5 is a view in plan showing the pasting or adhesive applying mechanism; and

Figure 6 is a view in perspective, partially broken away, of a bag tube.

The embodiment of my invention as illustrated in the accompanying drawings is a machine for making multi-wall bags. It is to be understood, however, that the invention is applicable to machines for making single wall bags.

The strip or web of paper 7, which is to be printed and which, in the present instance, is to constitute the outside wall of a multi-walled bag is taken from a supply roller 1 and is passed between driven printing rollers 2 and an impression roller 3. In the type of machine illustrated, two color printing is employed and hence the paper is next passed between another set of rollers comprising driven printing rollers 4 and impression roller 5.

The web after passing the last set of printing rollers is led downwardly from the printing mechanism about a guide roller 6 and then proceeds in a direction opposed to its initial direction of travel, toward the adhesive applying mechanism, the paper after passing through this last-mentioned mechanism going to the tube forming mechanism. This mechanism has not been illustrated, the same not constituting a part of the present invention.

The paper for the other walls of the bag, is taken from supply rollers 8, 9, 10 and 11, this paper passing directly to the adhesive applying mechanism instead of going to the printing rollers as was explained in connection with the web 7. After passing adhesive applying mechanism all of the webs are folded simultaneously into the form illustrated in Figure 6, where a bag tube has been designated 12.

The adhesive applying or pasting mechanism shown in the drawings constitute a part of my invention inasmuch as I have provided a paste applying or adhesive applying mechanism which I believe to be novel as applied to the making of multi-wall bags. In this connection I might say that it is the common practice in the making of paper bags to pass the paper web between a pair of rollers, one of which carries the paste or other adhesive which is to be applied to the web. Such an arrangement, while a practicable one, is, however, not entirely satisfactory, for the reason that should the paper web be torn at any place along its length, the paste from the paste applying roller will apply paste to the opposed roller, which otherwise would be dry, and the result is that after the torn portion of web is passed, the roller opposed to the paste applying roller will apply paste to the wrong side of the web. In other words, in addition to the application of paste to the side of the web which it is desired to apply the paste to, paste will be applied to the opposite side. I have provided apparatus in the present construction which efficiently overcomes this objection in that I eliminate the extra roller so that should a torn portion of the web pass over the paste applying roller, no damage is done so far as applying paste to the wrong side of the web is concerned. My improved apparatus comprises a gang of driven paste or adhesive applying discs 13, a disc being provided for each web and of course, properly disposed with relation to the web to be pasted as to apply the paste or other adhesive to the edge or near the edge of the web. These discs, which are mounted on a shaft 14, driven from any suitable prime mover through a belt 15 and pulley 16, for example, are all of the same diameter. I might mention in passing that this feature also is of advantage as compared with existing paste or adhesive applying mechanisms used in the paper bag industry in

that where a roller is employed opposed to the paste applying rollers, it becomes necessary, as will be understood, to employ paste applying rollers of gradually decreasing diameters, the diameter of the first roller of the gang to the diameter of the last roller being as the thickness of one web is to the thickness of the one web times the number of webs entering into the construction of the bag. Inasmuch as no rollers are employed opposed to my paste applying discs, and inasmuch as the paper webs pass about guiding rollers prior to and after leaving the paste applying discs, it will be obvious that all of my paste or adhesive applying discs may be of the same diameter, there being enough "give" to the web to take care of the difference in thickness between a single web and a multiplicity of superimposed webs.

The direction of rotation of the paste applying discs 13 is opposed to the direction of travel of the webs being pasted. For example, the web 7, as illustrated in Figure 1, is traveling upwardly adjacent the pasting mechanism in the direction of the arrow thereon, while the pasting disc is traveling or being driven clockwise. The webs, as above mentioned, pass about guiding rollers at each side of the pasting discs. For instance, the web 7 passes about a guiding roller 17 below the pasting mechanism and about guide roller 18 above this mechanism. The other webs also pass about similar guiding rollers similarly disposed. I have found that an arrangement such as I just described is exceedingly effective and insures a thorough and absolutely satisfactory application of the adhesive to the paper web and likewise permits of a higher linear speed of the web than possible with the paste applying devices heretofore used and above referred to.

The printing mechanism of this invention is shown more or less diagrammatically in Figure 1 and in detail in Figures 2, 3, and 4 and comprises, as above mentioned, a pair of printing rollers 2 adjustably and removably mounted on driving shaft 19. The adjustability of the printing rollers refers to adjusting of these rollers axially of their supporting shaft 19 and circumferentially of this shaft as well.

If two-color printing is to be employed, I provide a pair of similar rollers 4 which have already been referred to, these rollers being spaced from the rollers 2 and being adjustable axially as well as circumferentially of their driven drive shaft 20. Likewise the rollers 4 are removable from their driving shaft without necessitating removal of this shaft from its bearings.

Immediately below the set of printing rollers 2 is the adjustable impression roller 3, while immediately below the printing rollers 4 is the adjustable impression roller 5.

The centers of rollers 2 and 4 are fixed.

For driving the printing rollers and the impression rollers, I provide a drive shaft 21, mounted in suitable bearings and extending transversely of the machine. At one end of the drive shaft 21 I provide a gear 22, this gear meshing with gears 23 and 24, carried on the end of the shafts 19 and 20 which support the printing rollers.

The shafts 25 and 26, which support the impression rollers 3 and 5, respectively, are provided at the end opposite gears 23 and 24, etc., with gears 27 and 28 respectively, these gears meshing with gears 29 and 30 on the printing roller shafts 19 and 20.

33 designates a gear on the end of the shaft 21 opposite the gear 22, this gear 33 meshing with a bevel gear 34, carried on shaft 35, the lower end of this shaft being provided with gear 36 meshing with gear 37 on a drive shaft 38. This drive, it is to be understood, is merely by way of illustration, as obviously other drives could be employed to equal advantage. However, the printing rollers and the impression rollers are positively driven.

I have called attention above to the fact that the printing rollers 2 and 4 are adjustable longitudinally or axially as well as circumferentially of their respective shafts 19 and 20. In addition, these rollers are independently adjustable. This is important as it enables the type carried by the printing rollers to be accurately and quickly adjusted into the desired position with respect to the web being printed.

The printing rollers are alike in construction, each roller being split longitudinally as indicated at 39 and flanged at 40, each flange being provided with webs 41. By backing out the belts 42 in the webs 41 by which the two halves of each roller are bolted together so as to secure them to the drive shaft, it is obvious that each roller can be adjusted either longitudinally or circumferentially, or both, of the supporting shaft independently of all of the other rollers. It will be apparent also that the rollers may be as readily removed from their supporting shafts.

As above mentioned, the centers of the printing rollers, that is to say, the centers of shafts 19 and 20 are fixed and when it is desired to change the diameter of the printing rollers, it becomes necessary to make an adjustment of the impression rollers 3 and 5. In order that these rollers may be adjusted, that is, raised and lowered, so as to accommodate them to changes in diameter of the printing rollers, I have mounted each end of each of the shafts 25 and 26, on which these impression rollers are mounted, in adjustable bearings 43. Bodily adjustment as a unit of the bearings for each shaft is effected by a threaded sleeve or bushing 44 which receives a threaded member or shaft 45 attached to each bearing. The sleeve or bushing 44 is rotated by a worm wheel 46, keyed to the sleeve 44 and driven from a worm 47. The worm 47 is mounted on a shaft 48 extending parallel to the printing rollers and impression rollers, the worm and shaft being conveniently rotated by a hand-wheel 49. In order that this adjusting mechanism may be further adjusted so as to obtain absolute alignment of the impression rollers with the printing rollers, each worm is clamped to the shaft 48 as indicated at C in Figure 4. By loosening this clamp, each worm obviously may be adjusted both for initial setting of the worm and for taking up wear.

When the diameter of the printing rollers is to be changed, that is to say, when larger or smaller printing rollers are to be substituted, the necessary change in the drive for the printing rollers is effected by merely changing the gears 29 and 30.

It will be necessary also when the diameter of the printing rollers is changed to change the position of the inking rollers. These inking rollers have been designated I, there being a set for each of the printing rollers. The inking rollers I which are only shown more or less diagrammatically in Figure 1 are adjusted as a unit, that is to say, the inking rollers for the printing rollers 2 are adjusted as a unit, while the inking rollers for the printing rollers 4 are likewise adjusted as a unit. It will be understood that the adjustment of the inking rollers for the printing rollers

2 is independent of the adjustment of the inking rollers for the printing rollers 4. To permit of this adjustment of the inking rollers, the shafts carrying the same are mounted in a frame or mount F, this mount or frame being adjustable lengthwise of the main frame G of the machine.

The frame or mount is held in adjusted position by bolts G'. By moving the frame F toward or away from the shafts 19 and 20, it will be obvious that the inking rollers will be similarly moved or adjusted to position the inking rollers properly with respect to the surfaces of the printing rollers.

The printing rollers, in addition to their adjustability and other novel features above referred to, are provided with extensible type structures, this type being in the form of a blanket 50 and type 51. The blanket and type together constitute an extensible structure composed of a combination of rubber and canvas, for example, which permits of the application of the type structure to printing rollers which vary appreciably in diameter. Obviously the provision of this extensible type structure taken with the ease with which the printing rollers may be removed from their supporting shafts and substituted by other rollers of different diameters presents a commercially important advance in the bag making industry.

One end of the blanket 50 is attached to a shaft 52 extending lengthwise of the printing roller and projecting through the end flanges 53 and 54 thereof.

The blanket is passed about the roller and its other end is attached to a similar shaft 55. By slightly rotating either one or both of these shafts, obviously the blanket or type carrying member can be very quickly tightened upon the roller. To hold the blankets in position pawl and ratchet mechanism 56 is provided. The operation of this pawl and ratchet and mechanism is obvious from the drawings.

The arrangement of the structure just described permits of the blanket or type carrying members to be quickly removed from one set of printing rollers and quickly and readily applied to another set as will be evident, while the extensibility of this type structure adapts the same for printing rollers of different diameters.

It will be seen from the foregoing that I have provided in a bag making machine new and novel construction so far as the application of the adhesive or paste is concerned in the making of multiple wall bags wherein proper application of the adhesive to the several webs constituting the bag wall is assured, even though the webs may be torn here and there throughout their lengths. The type of adhesive or paste applying mechanism above described also permits of the webs being passed through the machine at higher linear speeds than heretofore, which, of course, is of advantage in machines of this character.

It will be seen also from the foregoing that the present invention provides a machine in which the printed web is reversed in direction, as compared to its initial movement when traveling to the printing rollers, thereby enabling the printed matter thereon to thoroughly dry or at least dry to the necessary extent before the web is passed to or through the tube forming mechanism.

It will be apparent also that I have provided printing mechanism for machines of the class above referred to in which the printing rollers are of new and novel design in that the same are readily adjustable, both axially and circumferentially of their supporting shafts and independently of each other and of the inking rollers, thereby enabling the printing rollers to be accurately and precisely located with a minimum of effort.

It will be seen also that the printing rollers may be quickly removed and as quickly substituted by other rollers of different diameters. It will be seen, furthermore, that the inking rollers have been made adjustable so as to accommodate these rollers to printing rollers of different diameters, the inking rollers for each printing roller being adjustable as a unit.

It will be seen also that I have provided impression rollers mounted in adjustable bearings, thereby permitting the use of printing rollers of different diameters without necessitating altering the position of the centers of the shafts carrying the printing rollers. In other words, the centers of the printing rollers are fixed while the centers of the impression rollers are adjustable.

Obviously modifications may be made in the construction which has been described above in detail within the purview of my invention.

What I claim is:—

1. In a machine for making bags, an impression roller, bearings for said roller, a threaded member having endwise movement fixed to each of said bearings, a threaded sleeve or nut threaded upon each of said threaded members, a worm wheel for each of said sleeves or nuts, a shaft, and a worm for each of said worm wheels adjustably clamped to said shaft.

2. In combination a printing roller shaft, adapted to receive and support printing rollers of different diameters for adjustment circumferentially and longitudinally of the shaft, and an extensible type structure adapted to be applied about the periphery of any of said rollers.

3. In combination a printing roller shaft adapted to receive and support printing rollers of different diameters for adjustment circumferentially and longitudinally of the shaft, an extensible type structure adapted to be applied about the periphery of any of said rollers under tension, and means for regulating the tension of said type structure.

ADOLPH POTDEVIN.