

April 7, 1936.

G. W. POPPE

2,036,883

BAG TUBE MECHANISM

Original Filed Sept. 30, 1932 4 Sheets-Sheet 1

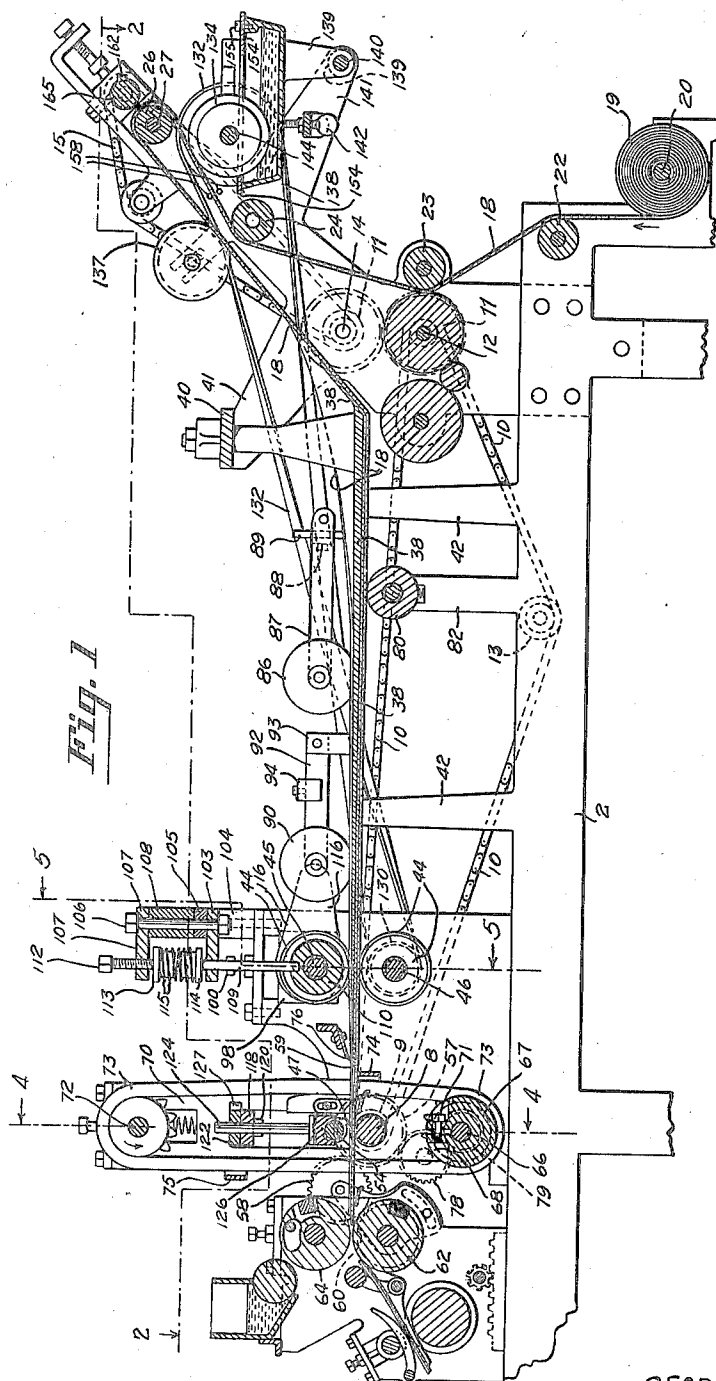


Fig. 1

Inventor

GEORGE W. POPPE

Geo. M. Dowe
Attorney

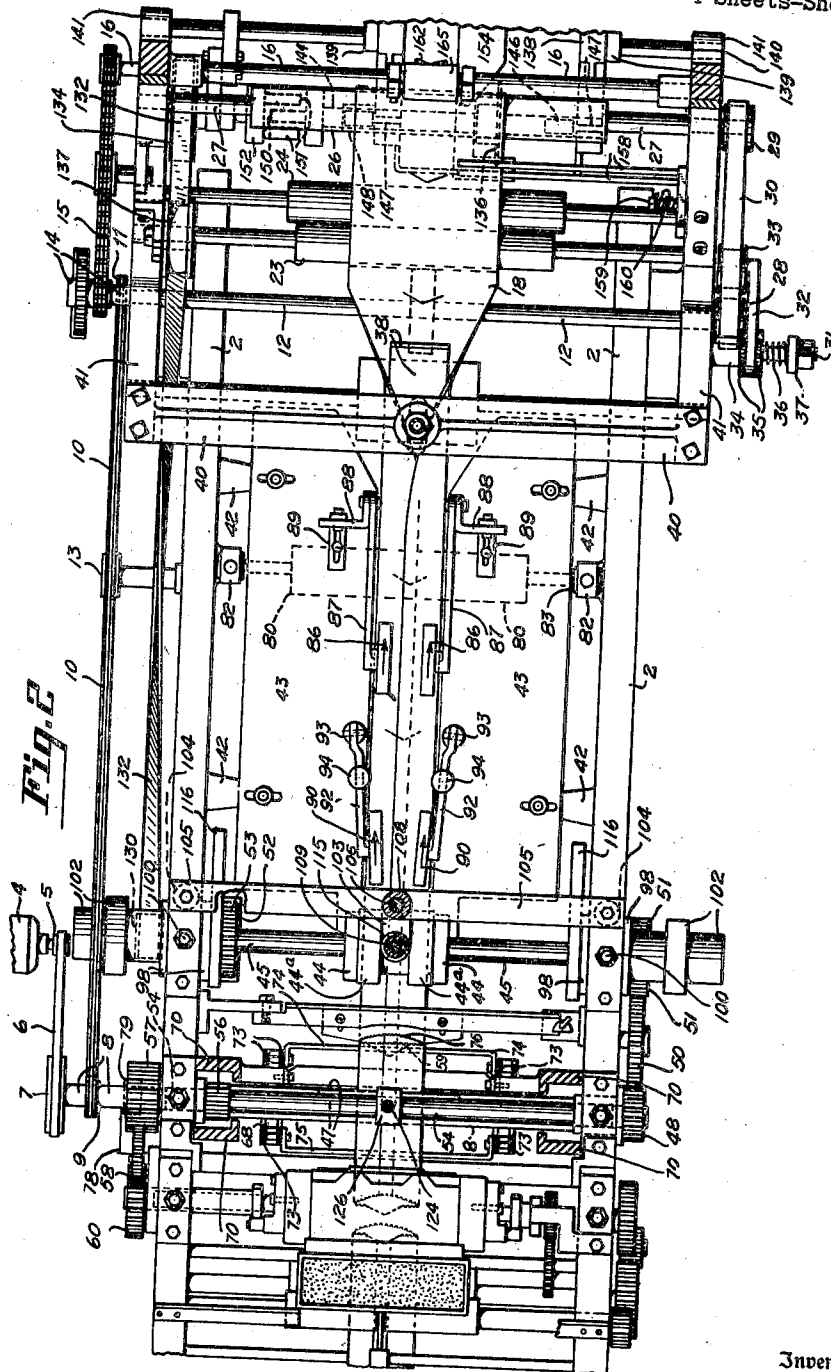
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Inventor

GEORGE W. POPPE

Geo. M. Dove
Attorney

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G. W. POPPE

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4 Sheets-Sheet 3

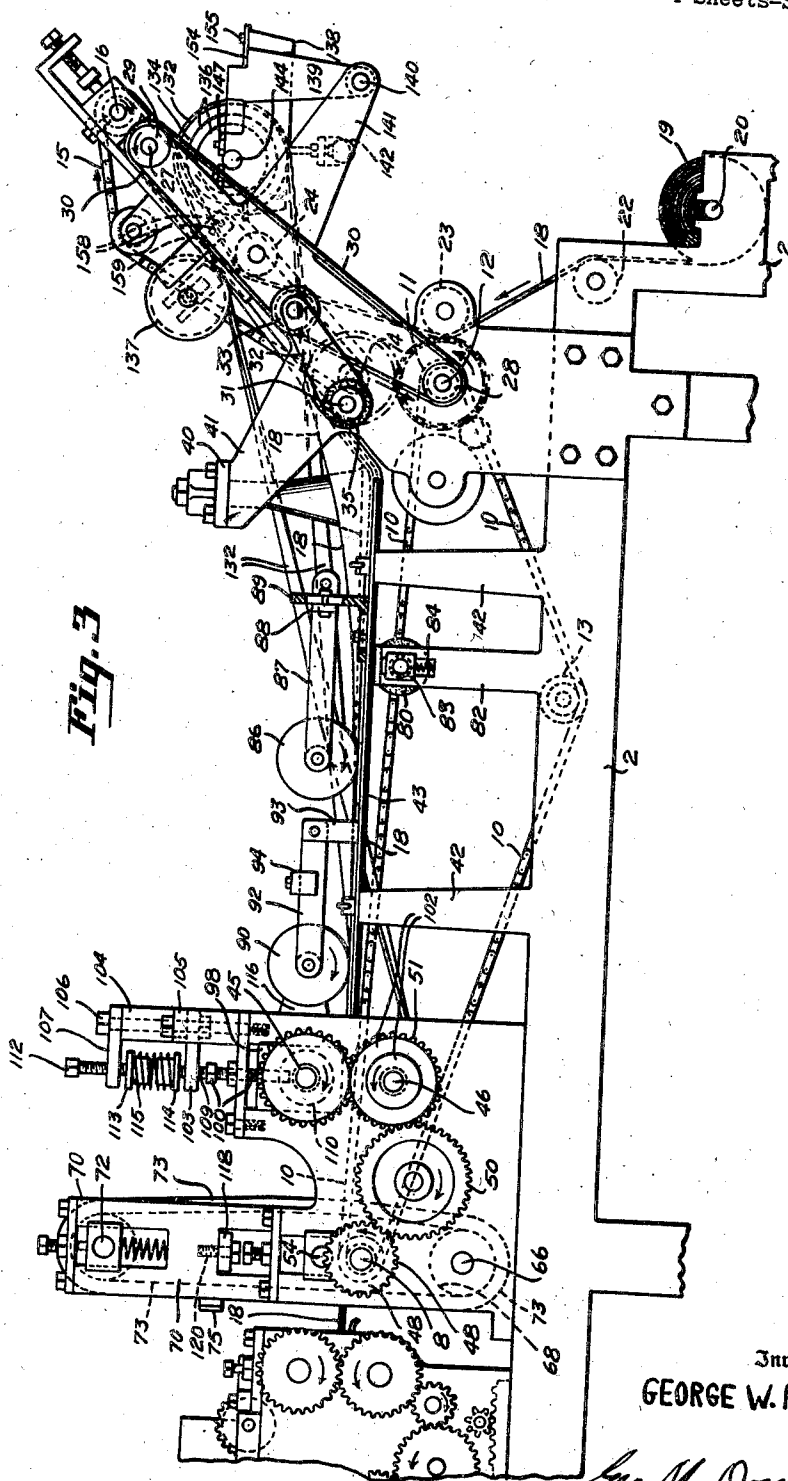


Fig. 3

Inventor
GEORGE W. POPPE

Geo. M. Dowe
Attorney

April 7, 1936.

G. W. POPPE

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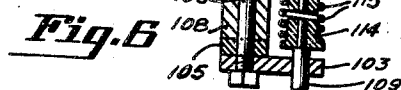
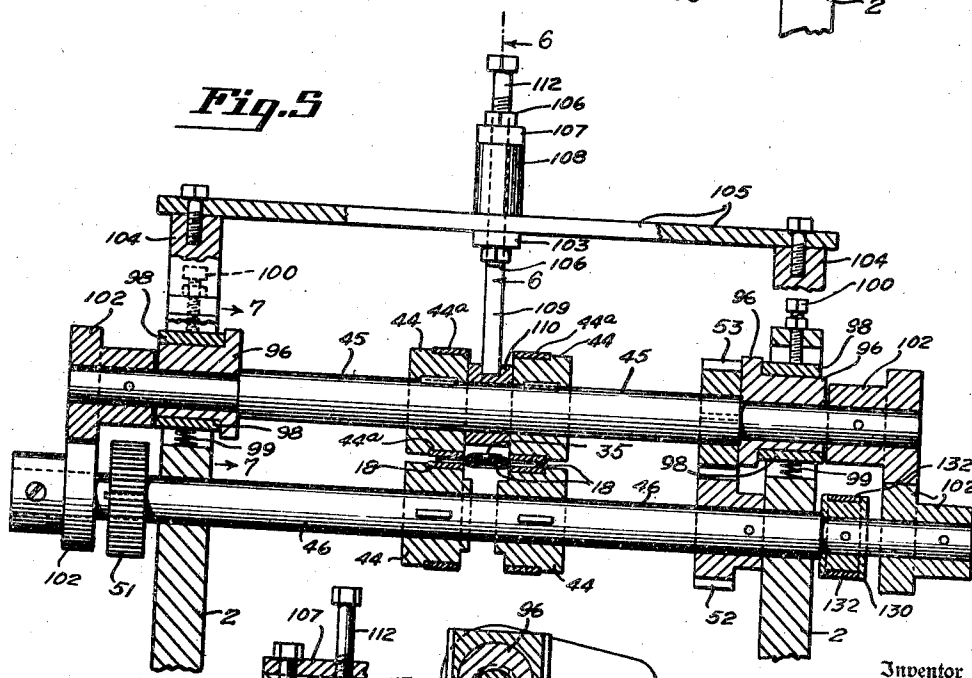
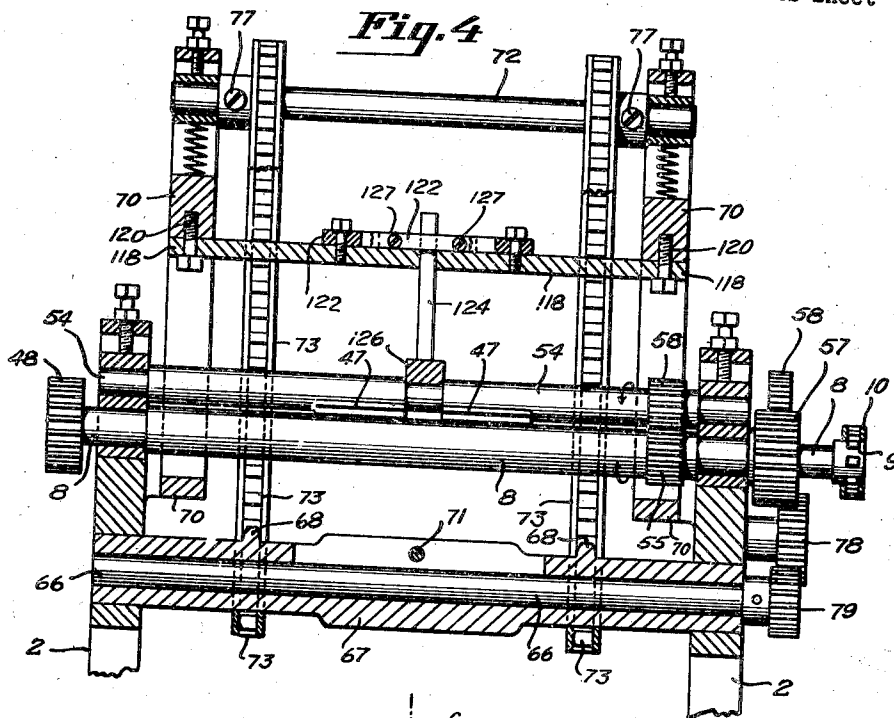


Fig. 7
GEORGE W. POPPE
By M. Dowe, Attorney

UNITED STATES PATENT OFFICE

2,036,883

BAG TUBE MECHANISM

George W. Poppe, Brooklyn, N. Y., assignor to
Equitable Paper Bag Co., Inc., Brooklyn, N. Y.,
a corporation of New York

Original application September 30, 1932, Serial
No. 635,533. Divided and this application June
21, 1933, Serial No. 676,872

4 Claims. (Cl. 271—2.3)

This invention relates to a machine for making bags and more particularly to the making of bags from relatively thin material. The improvements, however, are not limited to a machine for handling thin material but possess advantages when making bags of ordinary paper.

This application is a division of my application Serial No. 635,533, filed September 30, 1932.

An object of the invention is the better control of the bag material and the production of a more attractive and serviceable bag at minimum cost.

A feature of the invention relates to the provision of means whereby a very accurate adjustment of the feed rollers may be had and maintained and to ensure uniform pressure of the rollers against the bag tube. Other features and advantages will become apparent from the following description and claims when taken in connection with the accompanying drawings in which—

Figure 1 is a longitudinal section of a bag machine embodying my improvements;

Figure 2 is a plan and part sectional view on the line 2—2, Figure 1;

Figure 3 is a side elevation viewed from the bottom of Figure 2;

Figure 4 is a section on the line 4—4, Figure 1;

Figure 5 is a section on the line 5—5, Figure 1;

Figure 6 is a section on the line 6—6, Figure 5, and

Figure 7 is a section on the line 7—7, Figure 5.

Referring to the drawings and more particularly to Figures 1 and 2 there is the usual supporting framework 2, the side members of which carry the various shafts for driving the usual mechanism of a bag machine, together with brackets for supporting the various auxiliary structures with which the present invention is more particularly concerned.

Referring to Figure 2, the machine is driven from a motor 4 whose shaft is provided with a pulley 5 about which passes a belt 6 to a pulley 7 on the shaft 8, which carries the lower pinch roller and from which shaft most of the other parts receive their drive. On this shaft is also carried a sprocket wheel 9, Figures 2 and 4, over which passes a sprocket chain 10 connected to a sprocket 11 on shaft 12, Figures 2 and 3. A tension roller 13 is provided to keep the sprocket chain sufficiently taut. The shaft 12 carries a gear that meshes with a similar gear on a stud shaft 14. The latter shaft carries a sprocket wheel for engagement with a sprocket chain 15 by which motion is transmitted to shaft 16.

The paper or other material which is to form the bags is fed as a web 18 from a roll 19 supported on a shaft 20 in the lower portion of the rear framework. The web passes over guide rollers 22, 23 and 24 and around another roller 26 which reverses its direction of movement, the latter roller being carried by shaft 27.

The machine so far described is that which is found in an ordinary bag machine and is of well-known construction. In the present disclosure, however, the roller 26 which in ordinary machines serves merely to reverse the direction of the web is positively driven in timed relation with the feed rollers. This subject matter, however, is not claimed in the present application but is fully described and claimed in another division of my application Serial No. 635,533 above referred to.

The paper web after passing over the roller 26 is delivered to mechanism which folds it into the bag tube in the usual manner, such mechanism including a former plate 38, the right end of which, as indicated in Figure 1, is bent upwardly at about 45°. The former is supported from a bridge 40 carried by arms 41 projecting forwardly and upwardly. The web passes under the former and is folded over onto it as illustrated in Figure 2. Projecting upwardly from the side plates 2 are four standards 42 which support two plates 43, Figure 2, the plates being separated sufficiently to permit the bag tube to freely move between them. Adjustment of the plates to and from each other is effected by slotting the plates as shown in Figure 2 and providing set screws to hold them in the proper adjustment. These plates 43 support rollers which aid in giving the necessary control of the folded web and will be referred to later in greater detail.

The folded tube passes to the feed rollers indicated at 44, the upper pair of which are mounted on shaft 45 and the lower pair on shaft 46, these shafts extending into and being supported by the side frames of the machine. Preferably the upper rollers are provided with facings 44a of rubber, leather or other material such as will provide the desired surface friction. The lower rollers are of steel without facings. For driving the feed rollers there is provided a gear 48 on the shaft 8, Figures 2 and 3, which gear meshes with an idler 50 which in turn meshes with a gear 51 on the lower shaft 46. Near its other end but within the frame 2 the shaft 46 carries gear 52 meshing with gear 53 on the upper shaft 45. The gears 52 and 53 are of the same size so that the feed rollers rotate in a 1 to 1 ratio.

After the web has been formed into a bag tube by being folded over the former and passes between the feed rollers 44 it is severed into a bag length by mechanism including the so-called pinch bars and the striker bar. The pinch bars are also driven from the shaft 8 which has secured to it a pinion 55 meshing with a pinion 56 on the upper shaft 54 which carries the pinch bar 47, the pinions 55 and 56 also driving in a 1 to 1 ratio.

After the severance of the bag tube it passes on to mechanism which closes the bag bottom and this mechanism is of the usual and well-known construction and consists of upper and lower cylinders carrying respectively a tucker blade and clamp, which cylinders are likewise driven from the shaft 8. For this purpose said shaft carries a gear 57, Figure 4, meshing with an idler gear 58 carried by a stud shaft. The latter gear meshes with gear 60 on the lower cylinder 62 which is geared in a 1 to 1 ratio with the upper cylinder 64 carrying the tucker blade, which blade is not shown but which is of the usual and well-known construction.

The bag tube is severed by striker bar mechanism which in the present instance has been somewhat modified to make it easier to accurately adjust the striker bars. The detailed construction of this mechanism, however, is not described in the present application but is more fully described and claimed in my Patent No. 1,904,078, granted April 18, 1933, which is also a division of my application Serial No. 635,533.

For the purpose of the present disclosure it may be assumed that the striker bar and pinch bar mechanisms are of ordinary construction or of the construction shown in my application Serial No. 619,173, filed June 25, 1932.

After a bag length has been severed from the tube the bag bottom may be formed by the usual mechanism which is shown more or less diagrammatically in the drawings and which may be of usual and well-known construction. After the bottom of a bag is closed it passes on to delivering mechanism which also may be of usual and well-known construction.

It has been stated that the object of the invention was the better control and handling of the bag material both in the web and after the web has been folded into a bag tube. It is very important when very thin material is being handled, especially material such as cellophane, that the pressure of the various rollers on the web and tube shall be very accurately controlled and that the variations in pressure for different thicknesses of bag material shall be accurately compensated for. It is also important that the pressure shall remain constant during the various stages of bag formation. To this end I have provided a number of refinements whereby the main object of the invention is accomplished.

Reference has already been made to the positive drive of the roller 26. This relieves the web and bag tube of the strain which would necessarily be imposed upon it if the entire feeding of the paper were done through the feed rollers 44.

To aid in folding the material more accurately as it passes under the former and to prevent any slack which might otherwise occur I provide a soft rubber roller 80 shown in section in Figure 1 and in dotted lines in Figure 2. Said roller is supported by standards 82 on opposite sides of the machine frame and carries a bearing 83 which supports the roller yieldingly in engagement with the bag material, such yielding sup-

port being effected by means of one or more springs 84.

Mention has been made also of rollers engaging the upper portion of the bag tube and these will now be described more specifically. Just after the fold has been made it is engaged by a pair of rollers 86 which preferably are of rubber. These rollers are supported by arms 87 pivotably connected to brackets 88 vertically adjustable in bracket 89, which latter brackets are themselves adjustable along the plates 43.

In addition to the rollers 86, I further provide rollers 90 mounted in pivoted arms 92 supported in brackets 93 upstanding from the plates 43. To vary the amount of pressure exerted by the rollers 90 against the bag tube I provide weights 94 adjustable along the arms 92.

It has been stated that one of the features of the invention provides for very accurate adjustment of the feed rollers. Not only do I provide accurate adjustment but I also provide means whereby any rocking of the feed roller shafts is prevented. Referring to Figure 5, the upper feed roller shaft 45 is supported in eccentric bearings 96, which bearings are carried by bearing boxes 98 against which the springs 99 press with sufficient force to support the weight of the shaft and the parts carried thereby. Set screws 100 carried by the side frames bear against the bearing boxes 98 and enable the shaft 45 to be so adjusted that the upper and lower feed rollers are so spaced that they exert the proper pressure for the particular type of bag for which the machine is set to make. By reason of the springs 99 engaging the lower side of the bearing boxes the shaft 45 may yield in a downward direction and this yielding is provided to permit accurate adjustment. It is desirable, however, that the shaft be not permitted to rock and for guarding against this I provide what I call bearers mounted on the shafts 45 and 46. These bearers 102 consist of short collars secured to the respective shafts outside of the frame plates 2 and having very accurate cylindrical surfaces which in the properly adjusted position of the shafts do not contact. The adjustment is made by putting a thin piece of paper between the upper and lower bearers and adjusting the shaft 45 by means of the set screws 100 so that the paper is just barely caught by the bearers. Any tendency of the shaft 45 to rock therefore will be resisted by the bearers, the movement to effect contact between the same being merely that of the thickness of the piece of paper used in making the adjustment.

As a further means to prevent any tendency of the shafts 45 and 46 to separate I provide a central support for the shaft 45 yieldingly and adjustably holding said shaft against any upward thrusts to which it might be subjected. For this purpose the side frames are extended vertically as at 104 and support a horizontal plate 105. This plate is drilled near the centre and a bolt 106 serves to firmly support a lower arm 103 and an upper arm 107, a spacing collar 108 separating the two arms. A plunger 109 passes loosely through an opening in arm 103 and engages a depression in a collar 110 free on the shaft 45. In other words this collar is held from rotation by the plunger 109 while the shaft 45 freely rotates within the collar. A set screw 112 threaded into the arm 107 loosely engages a shouldered sleeve 113. Also loosely engaging the plunger 109 is a second shouldered sleeve 114 similar to the sleeve 113 but faced in the opposite direction as indicated in Figure 11. A spring 115 bears against

these shoulders and causes a yielding force to be exerted on the plunger 109 which force may be varied by adjustment of the set screw 112. A yielding support is thereby given to the shaft 45 near its center tending to hold it against upward thrusts.

By reason of the eccentric mounting of the shaft 45 the same can be raised and lowered by rotating the eccentric bearings 96 and for this purpose said bearings are provided with extensions 116 for manual operation.

What I claim is:—

1. In a bag machine the combination with a supporting frame having side members, upper and lower feed roller shafts supported in bearings in said side members, of feed rollers carried by said shafts between said side members and bearers comprising cylindrical discs secured to said shafts outside of said side members and means for supporting said upper shaft at its center against upward thrusts.

2. In a bag machine the combination with a supporting frame having side members, upper and lower feed roller shafts supported in bearings in said side members, of feed rollers carried by said shafts between said side members, bearers comprising cylindrical discs secured to said shafts outside of said side members, said bearers for the upper and lower shafts respectively being nor-

mally out of contact with each other, and means for supporting said upper shaft at its centre against upward thrusts.

3. In a bag machine the combination with a supporting frame having side members, upper and lower feed roller shafts supported in said side members, bearings carried by said side members for supporting said upper shaft, yielding means tending to lift the bearings of said upper feed roller shaft, means for holding said bearings in position against said yielding means, of feed rollers supported by said shafts between said side members, bearers comprising discs carried by said shafts outside of said side members for preventing rocking movements of said shafts relatively to one another.

4. In a bag machine, the combination with a supporting frame having side members, upper and lower feed roller shafts, carried by said side members, bearings in said side members in which said upper feed roller shaft is journaled, feed rollers carried by said shafts between said side members, means for yieldingly supporting said upper shaft bearings in said side members, and means on said shaft outside of said side members and cooperating with members on the lower shaft for preventing rocking of said shafts relatively to one another.

GEORGE W. POPPE.