H. F. PROVANDIE.

MACHINE FOR FORMING PAPER CUP BODIES.

APPLICATION FILED AUG. 30, 1913.

1,124,517.

Patented Jan. 12, 1915.

2 SHEETS—SHEET 1.

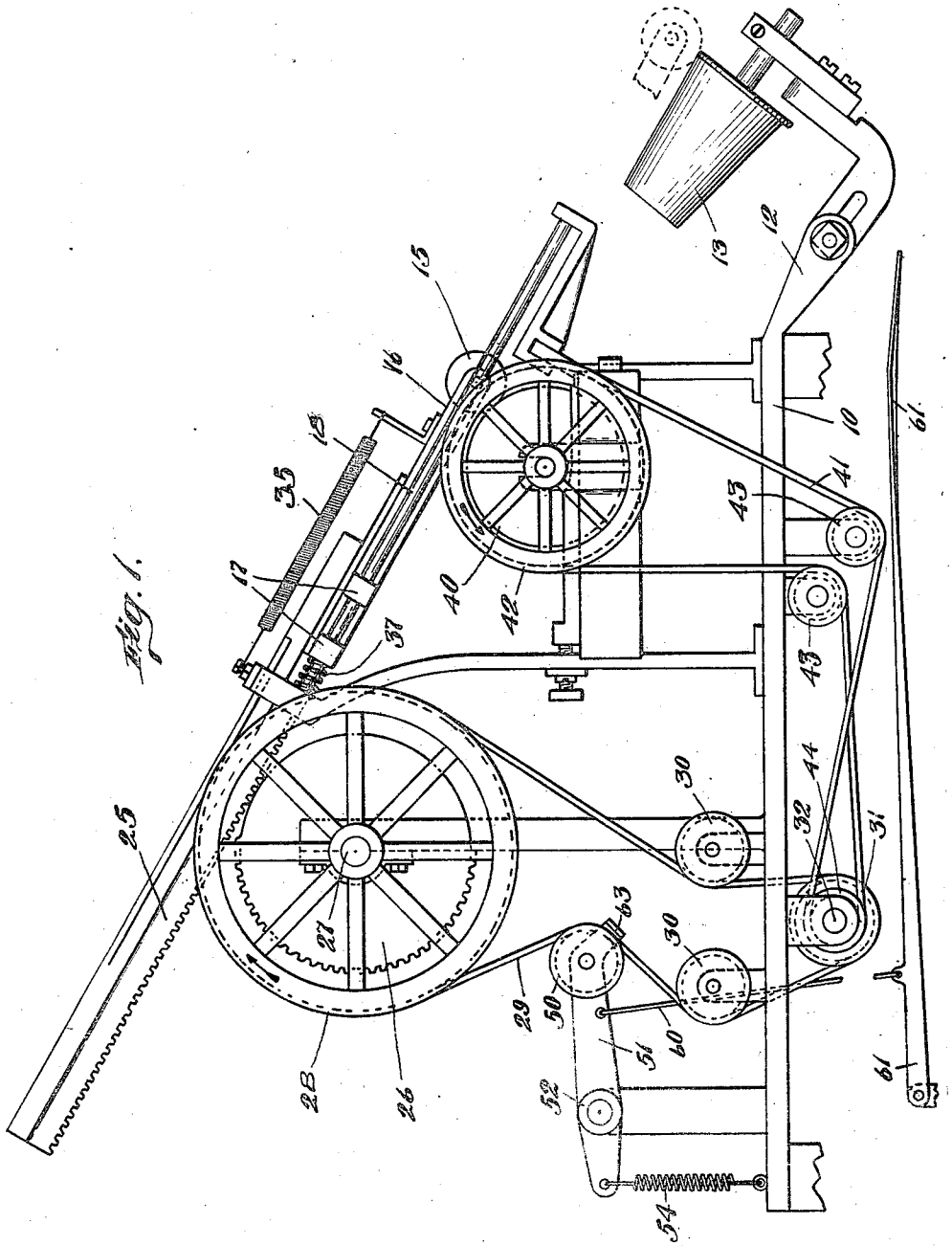


Fig. 1.

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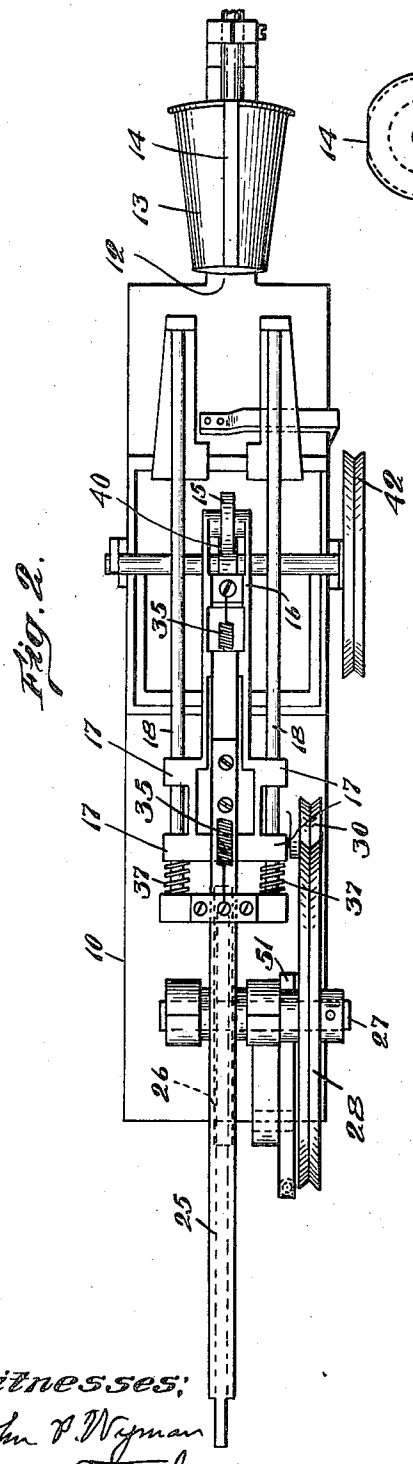


Fig. 2.

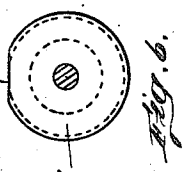


Fig. 6.

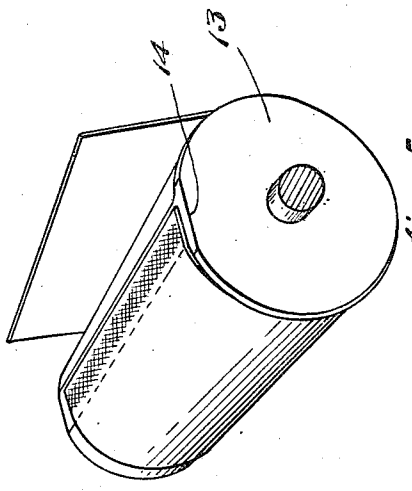


Fig. 5.

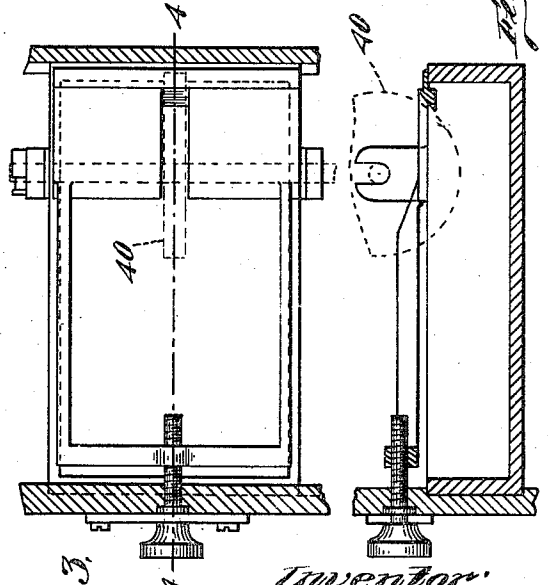


Fig. 3.

Fig. 4.

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UNITED STATES PATENT OFFICE.

HERBERT F. PROVANDIE, OF MELROSE, MASSACHUSETTS, ASSIGNOR TO AMERICAN WATER SUPPLY COMPANY OF NEW ENGLAND, OF BOSTON, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

MACHINE FOR FORMING PAPER CUP-BODIES.

1,124,517. Specification of Letters Patent. Patented Jan. 12, 1915.

Application filed August 30, 1913. Serial No. 787,428.

To all whom it may concern:

Be it known that I, HERBERT F. PROVANDIE, a citizen of the United States, residing at Melrose, in the county of Middlesex and State of Massachusetts, have invented an Improvement in Machines for Forming Paper Cup-Bodies, of which the following is a specification.

This invention relates to machines for forming paper cup-bodies for paper drinking-cups and the like. The cup-bodies of certain kinds of paper drinking-cups are composed of a piece of paper, herein termed a blank, adapted to be bent around a form and its side edges overlapped and secured by an adhesive substance, herein termed "paste". They are made frusto-conical and cylindrical according to the uses to which they are put.

This invention has for its object the provision of an improved pasting-device for applying a line of paste to one of the side edges of the blank, upon which the other side edge of the blank is subsequently pressed; and also to provide power-operated means for operating the pasting-device; and also to provide a controlling-device for the power-operated means whereby movement of the pasting-device may be arrested at any moment.

Figure 1 is a side elevation of a forming-machine for paper cup-bodies embodying this invention. Fig. 2 is a plan view of the same. Fig. 3 is an enlarged plan view of the paste-box. Fig. 4 is a longitudinal vertical section of the paste-box, taken on the dotted line 4—4. Fig. 5 is a perspective view of a form on which the cup-body is formed, with a blank thereon. Fig. 6 is an end view of the cup-body form.

10 represents the base of the machine, and 12 a forwardly extended adjustable bracket secured to the base for supporting the cup-body form 13, which latter is detachably secured to the bracket, permitting cup-body forms of other shapes and sizes to be supplied, as may be required. The cup-body form is arranged in an inclined position for the convenience of the operator, who sits in front of the machine. A frusto-conical cup-body form 13, is here shown for illustrating the invention. The cup-body form has a flattened portion 14, see Fig. 5, extended from end to end of it or thereabout, which serves as a seat or bed on which the pasting is done, said flattened portion being made wider than the pasting-roll.

15 represents the pasting-roll, which is rotatably supported at the forward extremity of a frame 16, which frame, as here shown, has laterally extended guiding-portions 17, 17, slidably mounted on parallel guide-bars 18 and 18, which provide for a reciprocating sliding movement of said frame 16, from the full to the dotted line positions shown in Fig. 1, and in a direction in parallel relation with the flat seat or bed 14 on the cup-body form. Said frame 16 has connected with it suitable operating-means for reciprocating it at regular intervals, or otherwise, as hereinafter described, and, as here shown, it has secured to its upper end-portion a rack-bar 25, which engages a mutilated gear-wheel 26, secured to a rotating-shaft 27, which is adapted to be continuously driven, as by a belt-pulley 28 secured to said shaft 27, over which passes a belt 29, which passes over idle pulleys 30, 30, and over a pulley 31, secured to a power-driven shaft 32. During each rotation of the mutilated gear-wheel the rack-bar and frame to which it is attached are moved in one direction, as forward for instance, positively, and are then permitted to return. Their return movement is accomplished by means of a spring 35, which is connected at one end to the frame 16, and at the other end to the machine-frame. As the frame 16, returns with considerable speed, buffer-springs 37, 37, are arranged on the guide-bars 18, 18, against which the frame strikes, thereby reducing the shock at the moment it resumes its normal position. In lieu of the operating-means here shown other operating-means may be employed for thus moving the pasting-roll at regular intervals.

The pasting-roll when in its normal position, as represented by full lines Fig. 1, en-

gages a paste-supporting roll 40, which is rotatably supported in a removable reservoir containing paste, and which is continuously rotated by any suitable means, as for instance by a belt 41, passing over a pulley 42, secured to the shaft bearing the paste-supplying roll, and over idle pulleys 43, 43, and over a belt-pulley 44, secured to the power-driven shaft 32. While the pasting-roll is in engagement with the paste-supplying roll it receives a supply of paste to be subsequently applied to the side-edge of a cup-body blank, and acts to apply the paste thereto when moved forward into engagement therewith.

The operator bends the blank around the cup-body form 13, and holds it with one of its side edges above the flattened portion 14 thereof, as shown in Fig. 5, while the pasting-roll remains in engagement with the paste-supplying roll, incident to the toothless portion of the mutilated gear-wheel passing beneath the rack-bar; then the toothed portion of said gear-wheel engages the rack-bar, and the pasting-roll is moved forward over the flattened portion 14, and a line of paste is applied on top of said portion or edge of the blank; and then said pasting-roll returns to normal position, again applying paste to the side-portion of the blank, and then the other side-portion of the blank is laid upon the aforesaid side-portion and pressed down firmly by the pressure of the hand, whereupon the side-seam is completed. The cup-body is then removed from the cup-body form and another blank placed thereon, and the aforesaid operations repeated.

Ordinarily, in operating the machine the time allowed by the toothless portion of the mutilated gear-wheel in passing beneath the rack-bar is sufficient for the operator to complete the closing of the side-seam and to remove the completed cup-body from the cup-body form, and apply another blank to said form preparatory to the next forward movement of the pasting-roll, but in case such time is not sufficient, under all conditions, controlling-means are provided for controlling the operation of the mutilated gear-wheel or other means employed for operating the pasting-roll at regular intervals, whereby its movement is or may be temporarily permitted to cease, and such controlling-means is arranged for operation by a treadle or other means under the control of the operator. As a controlling-means for the operating-means for the pasting-roll a treadle-controlled belt-tightening device is here shown, consisting of a roll 50, arranged for engagement with the belt 29, said roll being rotatably mounted on the end of an arm 51, which is pivoted at 52 to a stand on the machine-frame. A treadle-rod 60 is connected at its upper end to said arm 51, which is connected with a treadle 61, and upon depression of the treadle the arm is moved to cause the roll 50 to engage the belt with a sufficient degree of pressure to tighten it and cause the belt-pulley and mutilated gear-wheel to rotate, and when pressure upon the treadle is removed the arm 51 is raised by a spring 54, which is connected with it, to lift the roll 50 and reduce the pressure on the belt, so as to slacken it sufficient to admit of cessation of rotation of the belt-pulley and mutilated gear-wheel. While the operator is running the machine to the best advantage pressure will be continuously applied to the treadle, but in case of emergency, pressure thereupon may be instantly relieved, whereupon the paste-roll is caused to remain in this normal position, or if it has started forward it will cease moving, and in case the spring 35 is made very strong the frame bearing the pasting-roll and also the mutilated gear will be returned to normal position, although if said spring is not sufficiently strong to accomplish this result the pasting-roll will remain at rest in the position it occupies when pressure upon the treadle is relieved. A finger 63 is attached to the arm 51, which extends beyond the circumference of the roll 50 and over the belt 29, so that the belt runs between the roll and finger. This finger assists in keeping the roll in coöperative relation with the belt and also acts to deflect the belt in case it becomes stiff for any cause, and thus positively slacken it.

I claim:—

1. In a machine for preparing paper cup bodies, a cup body form, a frame including spaced guide bars arranged in parallel relation, a moving frame including guiding portions engaging the guide bars and a central portion, a pasting wheel carried by the central portion in advance of the guiding portions, and means for operating the moving frame whereby the pasting wheel may be extended in advance of the main frame to coöperate with the cup body form.

2. In a machine for preparing paper cup bodies, a cup body form, a main frame, spaced parallel guide bars supported on said main frame, a sliding frame including lateral portions having sliding coöperation with the guide bars and a central portion extending in body directions beyond the lateral portions, a pivoted wheel carried by the central portion in advance of the lateral portions and operating member carried by the central portion in rear of the lateral portion to actuate the moving frame.

3. In a machine for preparing paper cup-bodies, the combination of a cup-body form, a pasting-roll for coöperation with said form, a sliding-frame bearing said pasting-roll, a rack-bar secured to said frame, a mutilated gear-wheel engaging said rack-bar, a

belt-pulley secured to the shaft of said gear-wheel, a belt connecting said pulley with a power-driven belt-pulley, a belt-tightening device, and means for operating said belt-tightening device to slacken the belt and cause cessation of rotation of the gear-wheel, substantially as described.

In testimony whereof, I have signed my name to this specification in the presence of two subscribing witnesses.

HERBERT F. PROVANDIE.

Witnesses:

JOHN P. WYMAN,

AMOS L. TAYLOR.