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2,171,130

BAG-CLOSING APPARATUS

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2 Sheets-Sheet 1

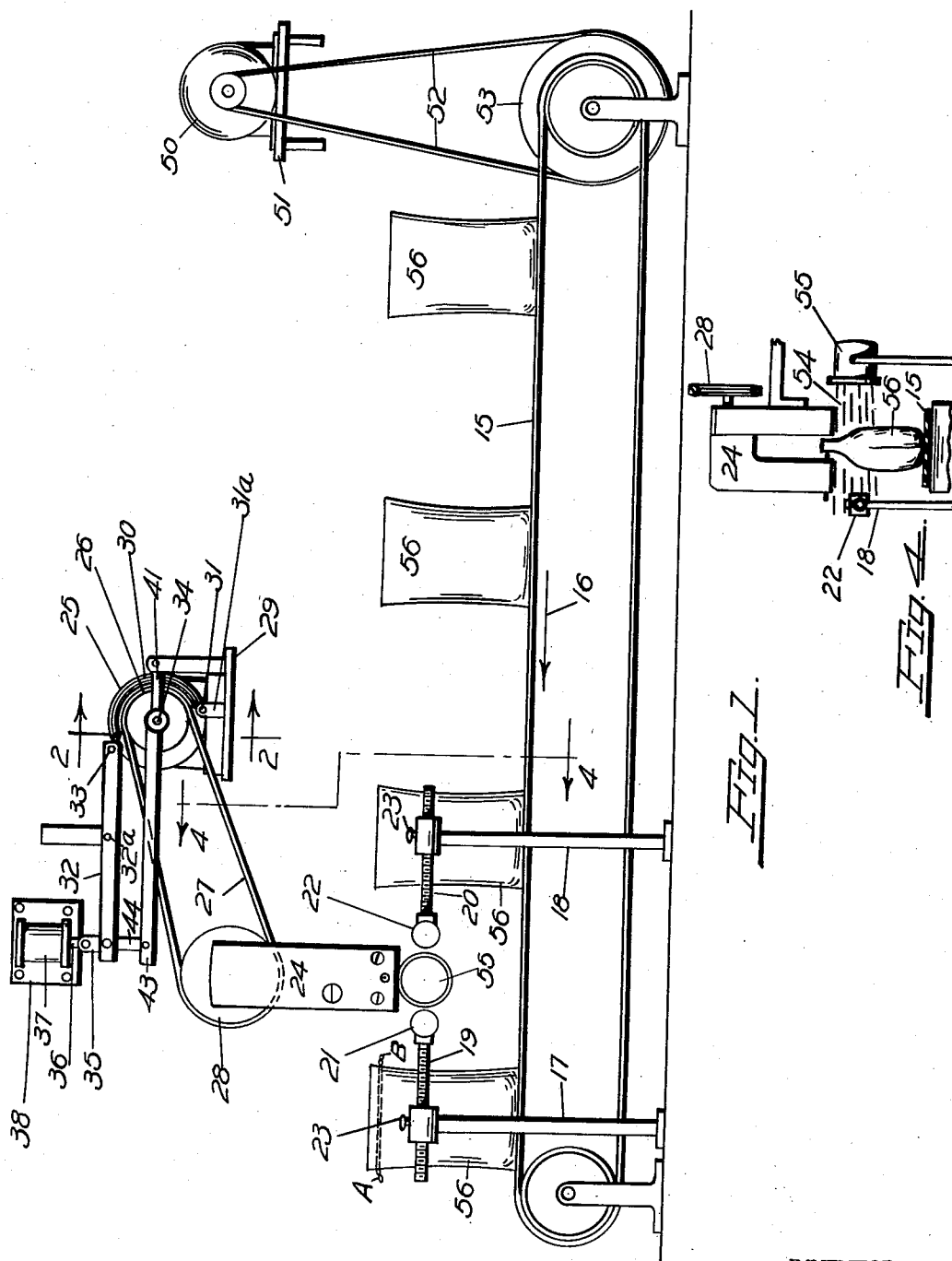


Fig. 1.

Fig. 4.

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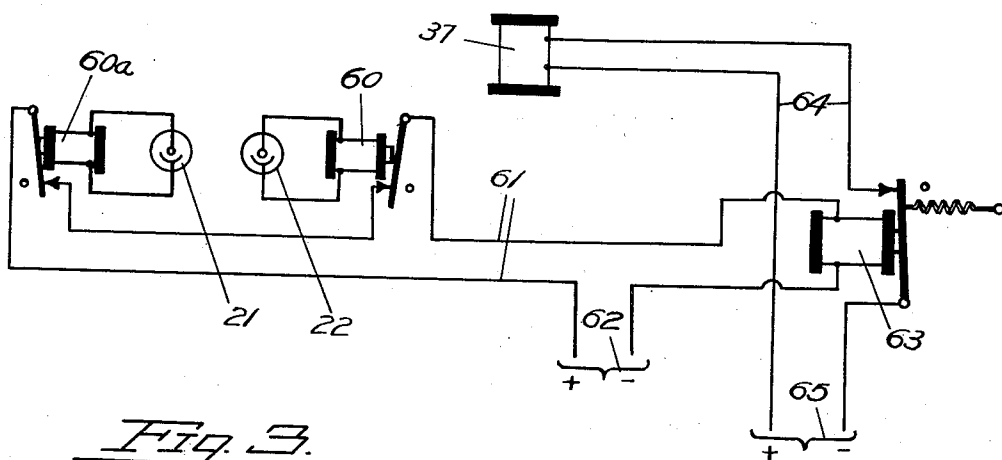
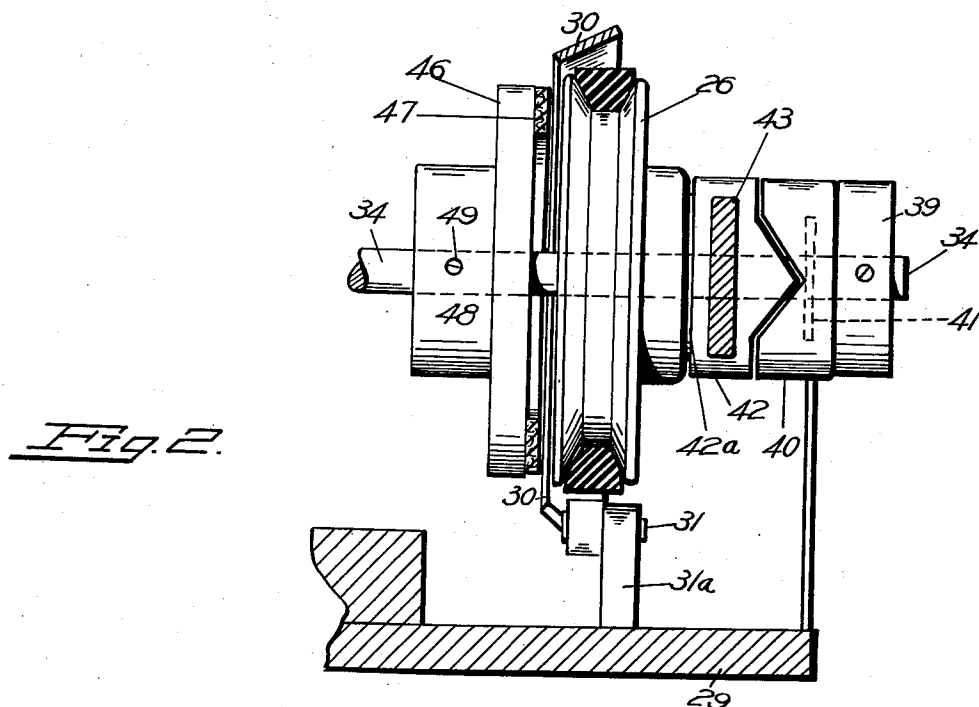
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2 Sheets-Sheet 2



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BAG-CLOSING APPARATUS

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Application September 7, 1937, Serial No. 162,748

2 Claims. (Cl. 112—11)

This invention relates to improvements in apparatus for closing by sewing filled sugar bags or the like.

An object of the invention is to provide apparatus that will automatically sew or stitch the tops of sugar bags or the like to close them after filling.

Another object of the invention is the provision of apparatus that will start and stop a bag-closing sewing machine in correct relation to the position of a moving bag that is being closed.

A further object is to provide an automatic braking mechanism in a bag-closing apparatus that will promptly decelerate the sewing machine after its driving power ceases, to prevent undesirable "coasting" that would continue the act of sewing beyond the optimum.

Other objects and advantages reside in details of design and construction that will be more fully set forth in the following description and in the drawings wherein like parts have been similarly designated and in which:

Figure 1 is a general side elevation of apparatus built according to a preferred form of the present invention;

Figure 2 is a fragmentary sectional view taken approximately along line 2—2 of Figure 1 and drawn to a larger scale for clarity;

Figure 3 is a wiring diagram of electrical circuits that are well adapted to be used in the apparatus illustrated in Figure 1; and

Figure 4 is a fragmentary sectional view taken approximately along the line 4—4 of Figure 1, and drawn on a reduced scale.

Description

First referring to Figure 1, a conveyor element is represented at 15 having normal movement as indicated by arrow 16. A pair of standards 17 and 18, respectively, are positioned adjacent the conveyor and each supports a longitudinal screw 19 and 20 respectively. The screw 19 carries a photoelectric cell 21 and the screw 20 carries another photoelectric cell 22. Set screws 23 may be used to hold each of the screws 19 and 20 in a selected position.

A typical chain-stitch sewing machine of the kind commonly used for sewing the closure of sugar bags, is shown at 24, and is driven by a motor 25 through the intermediary of a pulley 26 thereon, a belt 27 and a pulley 28 on the sewing machine. The motor may be mounted on a wall shelf 29 or any other convenient support, depending upon installation conditions.

A flexible brake band 30 is pivoted at 31 to a support 31a and attached, at its opposite end, to a brake lever arm 32 at 33. The lever arm is fulcrumed at 32a and is connected by a link 35 to a movable iron core rod 36 in a solenoid 37 that is mounted on a wall plate 38.

The details of the brake and clutch assembly are shown best in detail in Figure 2, wherein the motor shaft 34 carries a solid set collar 39 next to which is a stationary clutch member 40 that is held by anchor 41 from turning with the shaft. Another clutch member 42, having an anti-friction thrust bearing 42a, is attached to a clutch lever 43 that is connected at its opposite end with the brake lever arm 32 by means of a link 44.

The pulley 26 is loosely carried on the motor shaft, adjacent a friction disk 46 having a facing 47 and a hub 48 through which a set screw 49 tightly secures the disk assembly to the shaft. It will be noted that the brake band 30 is positioned at an angle to the belt 27 due to its shape which is frustro-conical.

A conveyor-driving motor is shown at 50 as mounted on a wall bracket 51 but any convenient position or mounting for the motor will suffice. Driving power is transmitted from the motor to the conveyor by means of a belt 52, and a pulley 53. A lamp or other source of a light beam 54 is shown at 55 and it will be seen that filled sugar bags 56 riding on the conveyor will pass between the source of light and the photoelectric cells. Normally the light is directed across the conveyor and onto the cells.

Operation

In use the filled bags are placed on the conveyor adjacent the right end as shown in Figure 1. When a bag passes between the source of light 55 and the photoelectric cell 22, a sensitive relay connected therewith and shown at 60, Figure 3, is de-energized, breaking circuit 61 that includes a source of low voltage electrical energy represented at 62. This de-energizes another relay 63 which opens a power circuit 64 that includes a source of power such as a common 110 volt light-supply, as shown at 65.

The circuit 64 is connected with the solenoid 37 so that when the relay 63 operates to break this circuit, the core-rod 36 and the lever arms 32 and 43, that are supported by the rod, fall by gravity. This movement rotates the clutch member 42 against the stationary clutch member 40 to impart a thrust to the loose pulley 26 so that it engages the clutch facing 47 to be rotated.

tated thereby and to impart driving force to the sewing machine 24.

The position of the photo-electric cell is such that the chain-stitch sewing starts just before the bag arrives at the sewing needle, and the driving force is delivered to the sewing machine as long as the circuits 61 and 64 are de-energized. The bag cuts off the light beam first from cell 22 and then from cell 21, that controls relay 60a, before cell 22 is again energized. As long as either cell is without the light beam, the apparatus will function to drive the sewing machine. The beam may cover a wide area so that a single beam will serve to actuate both cells or two separate beams may be used.

The position of cell 21 is such that the sewing will continue just past the edge of the bag. As the light again energizes both cells the circuits are also energized and the solenoid 37 draws the core-bar 36 upward to release the pulley 26 from its frictional engagement with the clutch facing 47 and at the same time the point 33 on the brake lever arm 32 is moved downwardly to apply the flexible brake band 30 to the part of belt 27 that is around the pulley. The angular engagement of the band with the belt quickly moves the pulley away from the clutch as the decelerating forces are applied, to promptly bring the sewing machine to a stop.

A sewed and closed bag is shown in Figure 1 at the left end of the conveyor. The photo-electric cells may be positioned to give various lengths of stitched threads on either side of closed bags as shown at A and B, Figure 1, by means of their respective supporting screws.

By moving photo-electric cell 22 to the right the sewing will start before the bag arrives and

the length of stitched thread at A will be lengthened and vice versa. Likewise by moving cell 21 to the left the sewed string at B will be longer. By providing the two cells, any width of bag can be sewed, and any length of stitched threads can be had at each side, as desired.

What I claim and desire to secure by Letters Patent is:

1. In bag-closing apparatus, a bag-conveyor, a bag-sewing mechanism, a source of light directing a beam across the path of bags carried on the conveyor, and a pair of photoelectric cells spaced in the direction of travel of the bags and positioned in the beam for starting and stopping the sewing mechanism according to the position of said bags, and means for adjusting said cells different distances apart for varying the lengths of stitching at the ends of the bags.

2. Apparatus for closing sugar bags or the like comprising in combination with a bag-conveyor and a bag-stitcher, a source of light normally directing a beam across the path of bags carried on the conveyor, a pair of photoelectric cells spaced in the direction of travel of the bags and positioned in the beam, means for adjusting said cells different distances apart for varying the length of stitching at the ends of the bags, a motor, stitcher-driving transmission mechanism engageable with the motor, and means inclusive of an electric circuit, a relay switch in said circuit, a source of electrical energy, a control circuit for said relay switch, and a solenoid in the first said circuit, for operating the transmission mechanism, said control circuit being governed by the cells according to the position of the bags.

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