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3 Sheets-Sheet 1



May 24, 1949.

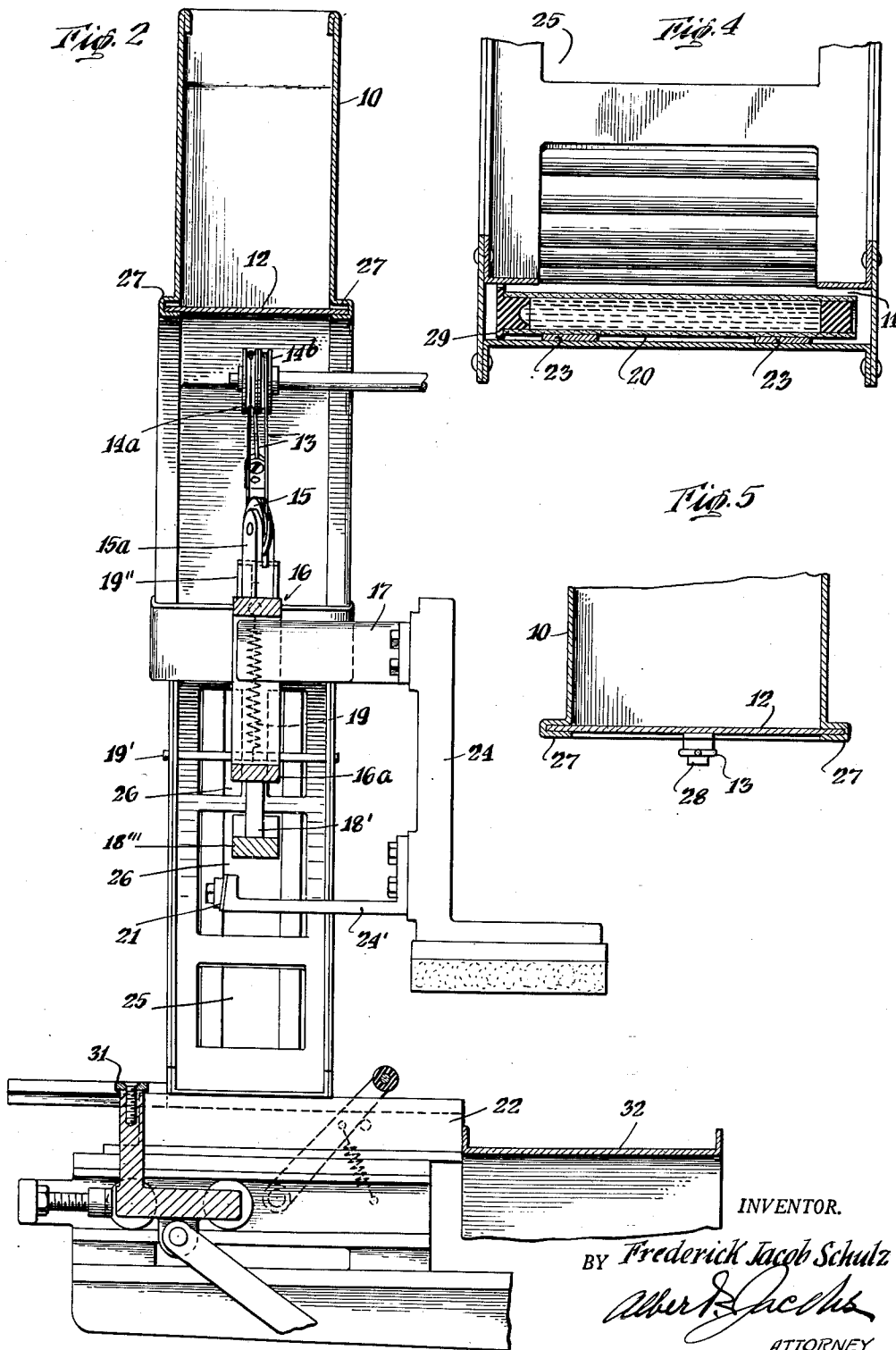
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LABELING MACHINE ATTACHMENT

Filed Feb. 27, 1945

3 Sheets-Sheet 2



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Fig. 3

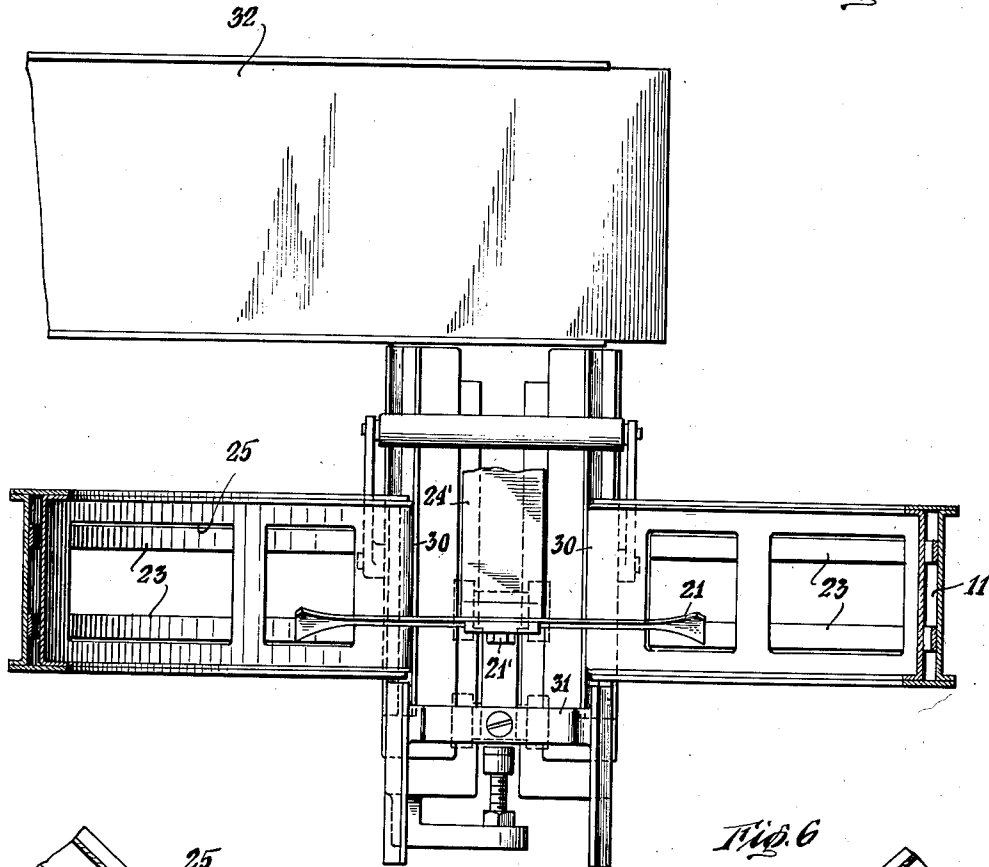
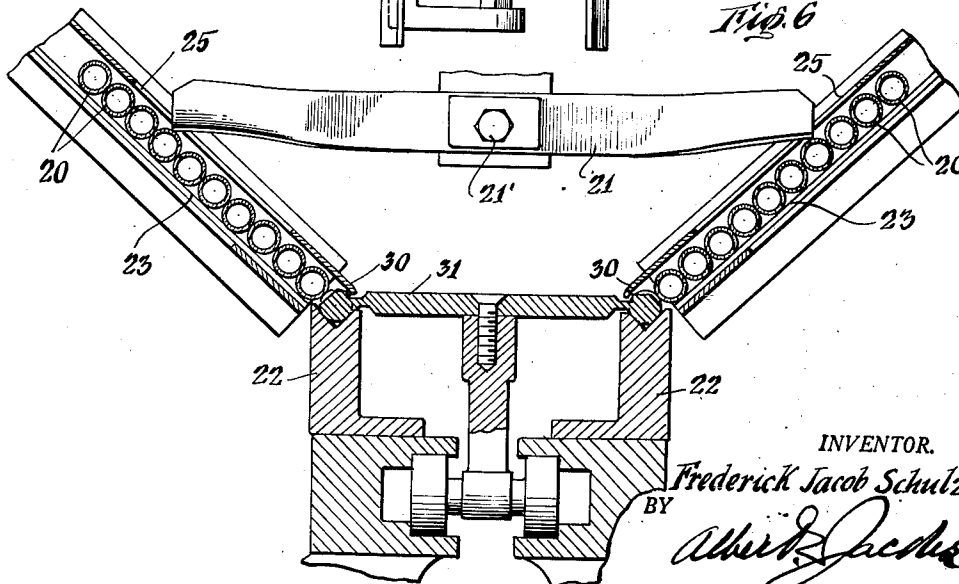


Fig. 6



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LABELING MACHINE ATTACHMENT

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5 Claims. (Cl. 312—80)

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The present invention relates to a mechanism for automatically feeding medicament or drug ampules or containers of cylindrical shape to a labelling or other machine. More particularly, the invention comprises an attachment to a labelling machine in which a gum label is attached to a cartridge-shaped ampule, hereinafter termed a cartridge for brevity and convenience and as so employed meaning any cylindrical or cylindrical type container adapted or intended to provide a charge of liquid for a hypodermic syringe or for any other use.

In the preparation of such cartridges for marketing, it is necessary to apply a label giving the necessary or desired information concerning and/or the directions for using the contents. In one widely used form these cartridges are, as will be observed from Fig. 4 of the drawings to be referred to hereinafter, small cylindrical glass tubes in each end of which is a rubber stopper or plug. One such stopper has an annular projecting flange. The diameter of this flange is somewhat greater than the diameter of the body of the cartridge. Due to this peculiarity of construction, there is a much greater frictional resistance at one end of the cartridge than at the other and this causes considerable difficulty in feeding or mechanically handling the cartridges. Due to the fragile nature of the cartridges and the value of their contents it is important not to damage or break any considerable number of them during handling. While machines have been proposed for feeding such cartridges to labelling machines, they have been subject to serious disadvantages which have largely prevented their use. As a result, the cartridges have been labelled by hand, and this ties up the services of workers who could be more advantageously used for other duties. The devising of a satisfactory automatic cartridge feeder has therefore been greatly desired.

One of the objects of the present invention is to make it possible to feed medicament cartridges mechanically and automatically to a labelling or other machine in an even, regular manner.

Another object of the invention resides in the provision of means through which such cartridges can be labelled automatically at a high rate of speed without damage to the cartridges.

A further object of the invention is to provide a feeding mechanism as an attachment to a more or less standard type of labelling machine which, when provided with the new attachment, becomes capable of labelling cartridges entirely mechanically.

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Another object of the invention resides in providing means for feeding cartridges automatically and at a relatively high rate of speed to a labelling or other machine while at the same time making provision for the peculiar structure of the cartridges and the unequal frictional forces resulting from rubber-to-metal and glass-to-metal contacts.

Other and further objects and advantages will be understood by those skilled in this art or will be apparent or pointed out hereinafter.

Having reference to the accompanying drawings forming a part hereof, in which:

Fig. 1 is a vertical sectional view, partly in elevation, of the present invention and contiguous parts of the associated labelling machine;

Fig. 2 is a vertical section taken along the line 2—2 of Fig. 1 giving an internal view of the runways or throats and showing in detail the reciprocating mechanism;

Fig. 3 is a horizontal sectional view taken on the line 3—3 of Fig. 1 illustrating the throats at the bottom of the machine;

Fig. 4 is a section through a throat showing one of the cartridges therein, taken on the line 4—4 of Fig. 1;

Fig. 5 is a section taken on line 5—5 of Fig. 1 illustrating the construction of one of the slides on the hopper bottom; and

Fig. 6 is a fragmentary sectional view on an enlarged scale of the lower portion of the machine showing in detail the spring mechanism near the convergence of the throats.

Like numerals designate corresponding parts throughout the various views of the drawings.

The embodiment selected to illustrate my invention is shown generally in Fig. 1. A hopper 10 of relatively large capacity is provided for receiving and holding cartridges or the like (see Fig. 4) to be fed into an associated machine, in this instance a labelling machine. The bottom of hopper 10 branches in the shape of an inverted V into two throats or runways 11 through which the cartridges or the like descend laterally. In each branch of the divided hopper 10 is a movable slide 12 which is attached to a cable or chain 13 which passes over pulley 14a and down to pulley 15, returning over a second pulley 14b and being attached to the other slide 12 in the other branch of the hopper 10. Pulleys 14a and 14b are mounted on a bar attached across the rear of the hopper as best shown in Fig. 2. Pulley 15 is mounted in a bracket 15a which is attached to and moves up and down with unit 16, which, in turn, is reciprocally actuated by an arm 17

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attached to the labelling machine. The length of the path of pulley 15 is controlled by the adjustment of the lock nuts 18. The slides 12 are pulled upward by the cables 13 as pulley 15 and unit 16 move downwardly under the actuation of the arm 17. When the arm 17 moves upward, releasing unit 16, the spiral springs 19 contract from their extended condition and pull the slides 12 downward to their former (lowermost) positions and pull the pulley 15 and unit 16 upward. Springs 19 are anchored at one end at pin 19' and at the other end to lug 19'' on the underside of slides 12. The up and down motion of the slides 12 causes the cartridges 20 to enter the throats 11 one at a time in a regular, even manner in lateral position without interruption.

The construction of slides 12 is illustrated in greater detail in Fig. 5 from which it will be further observed that the bottom of hopper 10 is provided with U-shaped edge flanges 27 into which slide 12 fits in freely slidable relationship. Attached to each slide 12 is a knob or the like 28 by means of which cable 13 is secured thereto.

The actuating force for unit 16 is supplied through the arm 17 which is coupled to the moving unit 24 of the machine upon which the feeding apparatus is attached. The distal end of arm 17 projects into the central window or opening of the quadrangular casting 16a of unit 16. In the present invention, the unit 24 is a reciprocable part of a labelling machine but this is to be understood as exemplary only and not as limitative since any available or known arrangement may be employed for reciprocating the unit 16 to the desired extent and in the desired direction and either independently or from an associated machine or part thereof.

Lock nuts 18 disposed on threaded guide rods 18' limit the upward motion of lugs 16' of unit 16 through which the guide rods extend, thus controlling the length of the stroke of the slides 12. Springs 18'' are disposed, as shown, between nuts 18 and lugs 16'. The lower portions of guide rods 18' extend through the apertured lugs 16'' of unit 16 and are secured to the stationary anchor plate 18''' which is attached to the associated labelling machine or to any other suitable stationary mounting. Further or alternative adjustments may be made by shortening or lengthening the cables or chains 13. The shorter each cable, the sooner will arm 17 engage the reciprocating unit 16 and the longer will be the stroke of the slides 12. The stroke of the slides 12 is adjustable so that no breakage of glass cartridges 20 occurs in the hopper 10 or throats 11. If one slide 12 should happen to become jammed or its movement retarded by any obstacle, the other slide will travel that much further. This feature, therefore, constitutes a safety factor and prevents cartridge damage and breakage.

Upon entering the throats or runways 11, the cartridges 20 descend laterally in single file due to gravity and the constricted size of the throats. Such cartridges, however, have exposed rubber surfaces 29 on one end, as shown in Fig. 4. These protruding rubber parts cause unequal friction between glass and metal on one end and rubber and metal on the other end. The inequality in friction is often great enough to interfere with level (horizontal) descent of the cartridges and to cause jamming in the throats 11. This effect may be eliminated by the very thin, flexible steel spring 21 made of clock spring steel, shown in detail in Fig. 6. The spring 21 is centrally mounted

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and secured at 21' and its flexible ends project through the windows 25 in throats 11 and thus contact the cartridges 20 near the ends having the exposed rubber surfaces, applying gentle force thereto. This causes the cartridges to move regularly toward the discharge ends of the throats 11. The spring 21 is attached to unit 24 by an arm 24', as shown in Fig. 2. The spring 21 is fastened to arm 24' at an oblique angle in order that the spring will flex readily when it strikes the cartridges 20 and hence exert only the desired gentle straightening and propelling force to the glass cartridges thus avoiding damage and breakage.

The sticking or jamming of cartridges, particularly in the throats 11, may also be eliminated by the addition of metal rails 23 on the bearing surfaces of the throats 11, as illustrated in Figs. 3 and 4. These metal strips or rails 23 prevent the rubber portions of the cartridges from bearing on the throats 11 and in this way the frictional resistance due to a rubber-to-metal contact is eliminated.

Throughout the throats 11 and in the sides of hopper 10 may be placed at intervals other windows or openings 26 similar to 25. These allow the operator or attendant to observe the movement of the cartridges 20. Actually, the throats 11 may be of open frame construction.

At the lower ends of throats 11, the metal sheets forming the tops of the throats or runways 11 are extended out over the V-shaped upper ends of the blocks 22 of the labelling or other machine upon which the above-described feeder mechanism operates. The sheet extensions 30 curve slightly downwardly, as shown by Fig. 1, and prevent cartridges 20 from spilling out of the throats 11. At the ends of the throats 11, the cartridges 20 are discharged uniformly into the V-blocks 22, in the same manner as by other feeding devices or manual feeding. The spring 21 assures the alignment of the cartridges 20 parallel to the V-blocks 22 in which they are to be received. When a cartridge or tube is placed in the V-blocks 22, others above it in the throats 11 are held in place by the extensions 30. Sufficient space is left between the extensions 30 and the V-blocks 22 to accommodate the ejector 31 of the labelling or other machine to which the feeder is attached, as shown in Fig. 6. Ejector 31 is provided with irregular enlarged ends shaped to slide in the V-shaped upper ends of blocks 22, thus pushing or ejecting the cartridges successively into a holder in which the labels are attached and/or to a chute 32 or to any other desired part of an associated machine for further handling or treatment.

The foregoing is intended as illustrative and exemplary only and within the terms of the appended claims various additions, omissions, modifications and substitutions may be made without departing from the scope or principles hereof.

I claim:

1. A device for feeding cartridges to an associated machine for further handling which comprises a hopper of relatively large capacity, the bottom of which is constructed in the form of an inverted V, a plurality of throats depending from and communicating with said hopper, slide mechanisms forming a part of said hopper bottom for guiding a single row of cartridges into each of the said throats, a flexible spring blade mounted between said throats intermediate the tops and bottoms thereof and means for actuating

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said spring blade to contact said cartridges in said throats through windows provided therein to maintain the cartridges in horizontally aligned positions.

2. A device as claimed in claim 1 in which the hopper bottom is provided with U-shaped edge flanges within which the slide mechanisms can slide freely.

3. A device as claimed in claim 1 in which the flexible spring blade is composed of clock spring steel and is mounted in an oblique position with respect to the vertical plane of the device.

4. A device as claimed in claim 1 in which each throat is provided with a curved extension at its lower end and a pair of rails along which the cartridges are adapted to move without coming into contact with the underlying throat surface.

5. A labelling machine attachment comprising a hopper with an inverted V-shaped bottom, a pair of slides constituting a part of the hopper bottom, a plurality of throats depending from and com-

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municating with said hopper, a spring blade mounted between said throats and projecting into said throats through windows provided therein and a unit for reciprocating said slides, said unit and said spring blade being synchronously actuatable by a part of the labelling machine.

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