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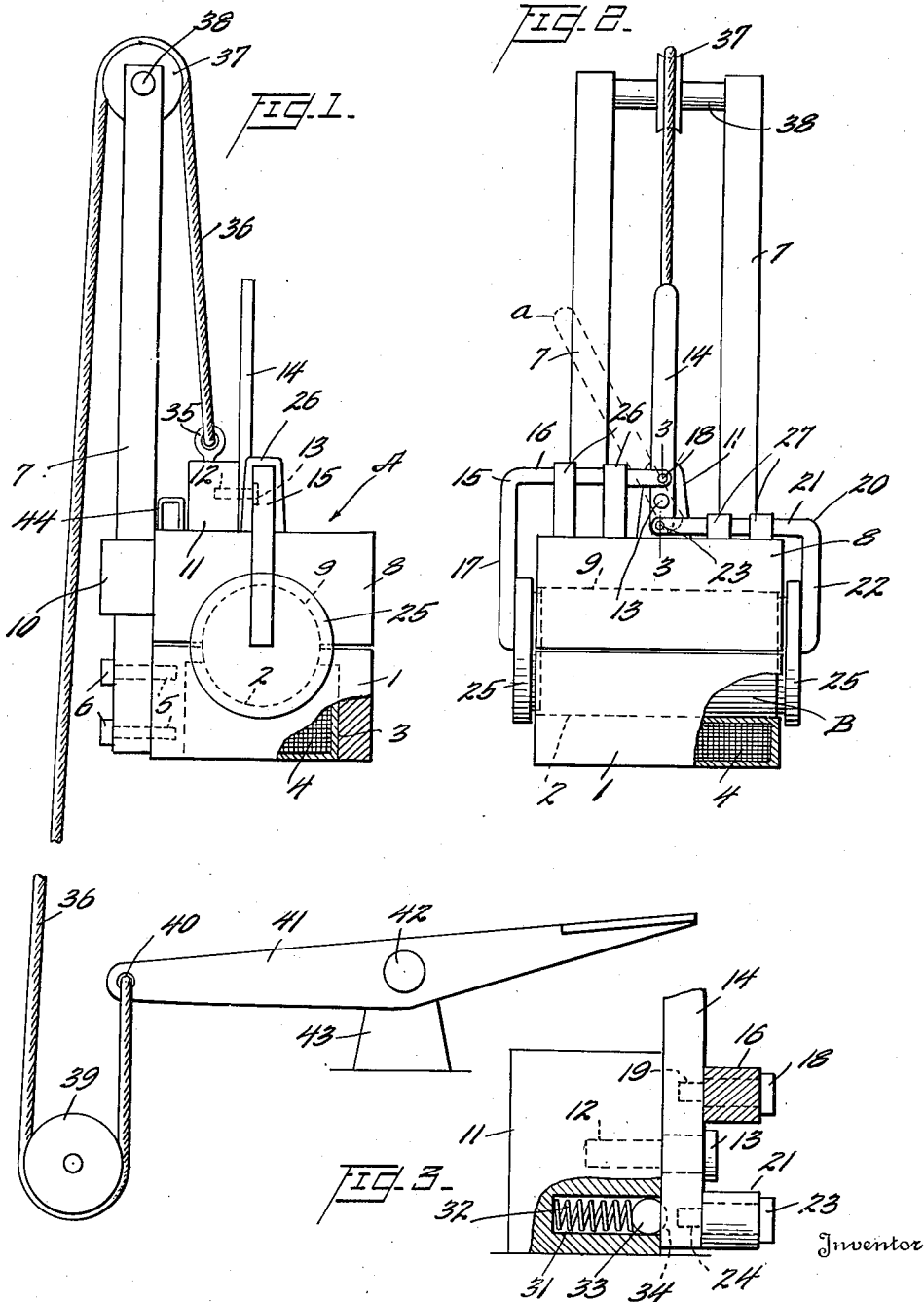
J. PEARLMAN ET AL

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APPARATUS FOR STRAIGHTENING FILLED CANS

Filed June 15, 1939

2 Sheets-Sheet 1



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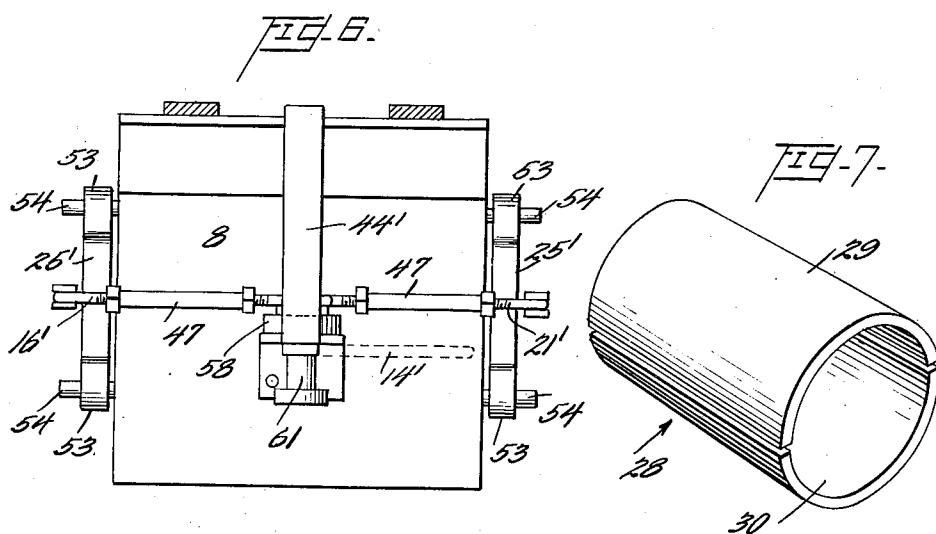
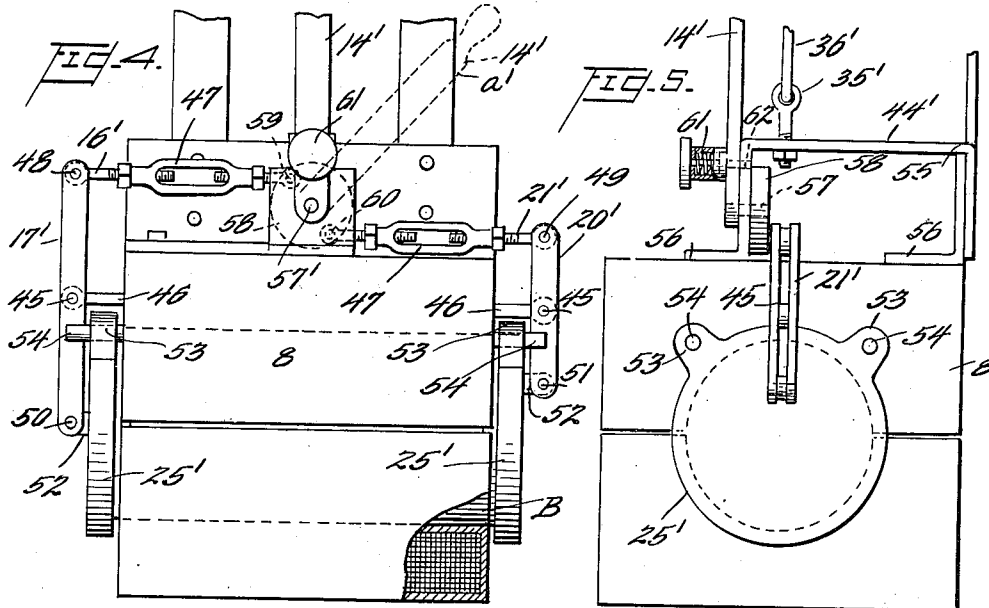
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APPARATUS FOR STRAIGHTENING
FILLED CANSJack Peariman, East Hempstead, Long Island, and
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Application June 15, 1939, Serial No. 279,362

10 Claims. (Cl. 153—32)

Generically this invention relates to straightening devices for cylindrical objects but it more especially is directed to an apparatus for removing dents and straightening filled cans.

Filled cans, by reason of various kinds of accidents during course of handling, frequently become dented and likewise bulged, rendering the cans unfit for sale except at a reduced price, thereby not only entailing extra expense in handling but net loss, and, therefore, one of the principal objects of this invention is the provision of a method and apparatus for removing irregularities from the surface contour of a filled can, including means for holding and confining the ends and upper half of the can, complementary means for receiving the non-confined portion of the can, and means for elevating and releasing said first mentioned means, to subject the non-confined portion of the can to a sharp impact with the receiving means.

Another important object of this invention is the provision of a method and apparatus of this character consisting of a stationary die base adapted to seat half of a filled can, a vertically movable complementally formed impacting die adapted to seat the other half of said can, can end engaging adjustable die plates, means carried by the impacting die for effecting and maintaining the die plates in gripping engagement with the ends of a can, and means for elevating and permitting gravity descent of said impacting die and can to effect a sudden impact of the lower half of the can with the base die, whereby the forces generated by the impact function to remove irregularities from all surfaces of the can.

In cans filled with foodstuffs of various types, by reason of unforeseen contamination during the can filling operation or in connection with the food itself, not infrequently causes bacterial action to develop, rendering the contents unfit for consumption, and such action causing swells or bulging of the can, usually at its ends. This situation gives rise to a rigid inspection and in the past it has been difficult to determine whether such irregularities in the contour of the can are caused by bacterial action or by jolts, knocks, dents and the like, and by reason of which fact many good cans are discarded as condemned and unsalable stock in error, and, therefore, an important object of this invention is its utilization as a testing means not only for straightening out the irregularities but in so doing constituting a testing means for determining whether the irregularities were caused by external forces or by deterioration of the contents.

With these and other objects in view, which will become apparent as the description proceeds, the invention resides in the construction, combination and arrangement of parts, herein after more fully described and claimed, and illustrated in the accompanying drawings, in which like characters of reference indicate like parts throughout the several figures, of which:

Fig. 1 is an end elevation of our improved can straightening mechanism.

Fig. 2 is a front view of Fig. 1.

Fig. 3 is a sectional view taken on the line 3—3 of Fig. 2.

Fig. 4 is a front view of a slightly modified form.

Fig. 5 is an end view of Fig. 4.

Fig. 6 is a plan view partly in section of Fig. 4.

Fig. 7 is a perspective view of sectional adaptor or removable shell.

The devices with which we are familiar for removing the irregularities from filled cans have proven deficient for many reasons, some of which are: incapable of satisfactory operation; too complex and costly to manufacture and operate; affecting the normal condition of the contents, as, for instance, by a centrifugal device, which in certain types of foodstuffs effects changes in their physical characteristics and consistency; and it was to overcome such disadvantages by providing a segmental base member and a complementary vertically movable drop block member, each of said segmental members adapted to embrace one-half of a filled can; said block member having adjustable end plates or dies and means for moving the dies into engagement with the ends of the can and automatically locking them in can-engaging position and maintaining the can in seating position within said block, a magnet mounted in the base block, a series of reduction shells adapted to be mounted in the hollowed out portions of said blocks to interchangeably fit different sized cans, said movable block being mounted on guides rigidly carried by the base block, means associated with said guides and movable block to effect elevation of the block and can and releasable to permit gravity descent of said block and can unit to cause a sudden or sharp impact of the non-confined half of the can with the base block to effect removal of irregularities in the surface contour of the can, that we designed the method and apparatus forming the subject matter of this invention.

In the illustrated embodiment characterizing this invention there is shown a device A comprising a substantially rectangular base member 1

hollowed out as at 2 to snugly embrace one-half of a filled can and is recessed underlying said cut-out portion as at 3, and suitably mounted in said recess is a magnet 4 hollowed out similar to portion 2 in member 1, and adapted to be connected to a suitable source of electrical energy not shown. The rear side of member 1 is formed spaced from each end with threaded openings 5 adapted to receive the threaded stud bolts 6 extending through the spaced parallel perpendicular guide bars 7. A complementary drop slide block 8 having semi-circular hollowed out portion 9 corresponding to the hollowed out portion 2, to seatingly receive one-half of the filled can, is adapted when not in use to seat on base 1. A sleeve guide member 10 is slidably mounted on each of the guides 7 and welded or otherwise suitably secured to the rear side of block 8. Block 8 is formed on its upper surface with a centrally disposed upstanding integral post 11, formed with a threaded opening 12 adapted to receive the threaded end of the pivot or bearing pin 13 extending through the upright lever 14 at a point spaced from its lower end.

Associated with block 8 is an arm 15, in the present instance, having a horizontal section 16 and a depending section 17, with the free end of said section 16 pivotally mounted on stud bolt 18 threaded or otherwise engaged in lever 14 as at 19, and a substantially similar arm 20 having a horizontal section 21, similar to 16 except extending in the opposite direction, and a depending section 22, with the free end of section 21 pivotally mounted on bolt 23 threaded or otherwise engaged in the lower end of lever 14 as at 24 on the opposite side of bolt 13 from bolt 18. Suitably mounted on the free ends of arms 15 and 20 are the end die or can end engaging members 25. Mounted on the upper surface of block 8 are the guide members 26, through which arm 16 is adapted to operatively extend, and substantially similar guides 27 are similarly mounted on block 8 opposite to guides 26 and through which arm 21 is adapted to operatively extend. The contacting faces of dies or plates 25 may be formed to correspond with the end configuration of standard cans and these dies are adapted to be interchangeable in accordance with different sized cans. A removable sectional shell 28 is adapted to fit in block 1 and base 2, section 29 of which is adapted to seat and be suitably mounted in the hollowed portion 9 and section 30 adapted to seat in the hollowed out portion 2 of base 1. It is apparent that shells 28 of different sizes may be interchangeable to engage cans of different sizes, and/or a series of nested sections 29 and 30 may be employed as reduction elements for different sized cans if desired.

When the dies 25 are in can engaging position the lever 14 is substantially perpendicular, and in order to maintain the lever in such position, an opening 31 is formed in member 11 and mounted in said opening is a spring 32 and ball 33 adapted to seat in the indentation 34 formed in the rear surface of lever 14 for automatically maintaining said lever in locked position, but permitting release when manually operated.

An eye-screw 35 is threaded or otherwise suitably secured in the upper end of post 11 to which is secured one end of cable 36, said cable extending upwardly and over pulley 37 rotatably journaled on shaft 38 suitably mounted in the upper ends of guides 7, and extending downwardly under pulley 39 suitably anchored below device A, and with its end secured as at 40 to one

end of treadle 41 rockingly mounted on shaft 42 suitably mounted in the upper end of base support 43, as will be well understood. It will be noted that when the dies are in closed position with the can therebetween there will be a slight space between the meeting faces of the dies.

While the operation of the device would seem to be clear from the above description, it might be well to further state that depression of treadle 41 through cable 36 effects separation of the dies and elevation of die 8 to permit the filled can to be positioned in hollowed out portion 9 whereupon movement of handle or lever 14 from its die opening position as shown in dotted outline as at a to substantially perpendicular position moves dies 25 in meeting direction and into pressing engagement with the ends of the can and when the force is removed from said lever 14 spring 32 will urge ball 33 into indent 34 thereby maintaining the lever in can gripping position and the can in die seating position. Treadle 41 is then depressed to elevate die 8 together with the can to the desired height on guides 7, and release of said treadle permits die 8 and the can to drop, causing the lower half of the can to engage the base die 1 with a sudden or sharp impact thereby causing opposed forces of the dies and can contents to straighten or remove irregularities from the surface contour of the can B.

While the drop block or impacting die section 8 is preferably operated by the treadle mechanism as above described, it also may be manually operated by handle 44 suitably mounted thereon.

The magnet 4 in connection with certain types of contents and where the can is "slack filled" is of special advantage in case of fine dents or very slight irregularities. It will be further observed that if the can is flattened and wider in one direction the widest diameter should be placed so as to come within the hollowed-out portions 9 and 2.

Figs. 4, 5, and 6 are directed to a modified form, which is substantially similar to the form previously described, the principal differences being that the arms 15 and 20 have been modified to increase their adjustable range with respect to different length cans.

In this form arm sections 17' and 20', each preferably comprising two metal strips, are pivotally mounted substantially central of their length as at 45 on the ends of rods 46 suitably secured in the ends of block 8 and extending laterally therefrom. Sections 16' and 21' are severed central of their length and connected by turn buckles 47 by means of which they are adjusted, as will hereinafter be more fully explained. Sections 17' and 20' are pivotally connected at their upper ends to sections 16' and 20' by pins 48 and 49, respectively, and at their lower ends by pins 50 and 51, respectively, to lugs 52, integrally or otherwise formed on the end dies or plates 25'. It will be seen that operation of sections 17' and 20' effects adjustment of dies 25', and in order to permit their freedom of movement and adjustment to cans of different lengths they are formed with spaced ears 53 apertured to receive the pins 54 threaded or otherwise connected to the ends of block 8 and on which guide pins said dies 25' are slidably maintained in proper position.

A metal strip 55 suitably bent to form handle 44' is mounted transversely on the upper surface of block 8 with its perpendicular end portions 56 suitably secured thereto. This handle frame member also takes the place of post 11.

Handle 14' is pivotally mounted on pin 57 journaled in front end portion 56 and having rigidly mounted on its opposite end disc 58 to one side of which is pivotally secured section 16' by pin 59 and section 21' is similarly connected to the opposite side of said disc by pin 60. Suitably mounted on lever 14, is the spring plunger mechanism 61 adapted when the lever is moved to operating position to effect engagement of the dies 25' with the ends of can B to engage in opening 62 formed in end 56 and lock the lever in such position, the plunger being manually operable against the action of the spring to permit movement of said lever to end die disengaging position, as shown in dotted outline at a', in which position plunger mechanism 61 engages a similar opening 62 to maintain the dies 25 in open position. Eye screw 35' is bolted or otherwise secured to handle 44' and to which is secured one end of cable 36' similar to cable 36 heretofore described and by means of which impacting die may be similarly operated.

It will be thus seen that the handle structure 44' not only serves as means for manually operating the die 8 but also takes the place of post 11 to constitute a mounting for lever 14' and it is also apparent that the action of lever 14' with respect to end dies 25' is similar to that described in connection with lever 14 and dies 25, except that the connecting arm structure through the instrumentality of turn buckles 47 effects adjustment of end dies 25' to cans of different lengths. It is therefore apparent that except as modified to effect adjustability of dies 25' the form illustrated in Figs. 4, 5, and 6 is similar to the form described in connection with Figs. 1 and 2.

From the above it is apparent that we have designed a can straightening method and apparatus compact in form, simple in construction, manufacturable at a reasonable cost, adjustable to filled cans of varying diameters and lengths and efficient not only to remove irregularities from the contour of the can but also as a testing device to determine whether the irregularities, especially with reference to the ends of the can, are caused from the application of exterior force such as dropping the can, denting it, etc., or from the deterioration of the contents so that only the cans damaged from the latter cause may be discarded.

With reference to the use of the preceding apparatus for determining whether the irregularities are due to the effect of the handling of the can or to deterioration of its contents, if from the former the removal of the irregularities will be permanent, but if from deterioration of the contents they will instantly return.

Although in practice we have found that the form of our invention illustrated in the accompanying drawings and referred to in the above description as the preferred embodiment, is the most efficient and practical; yet realizing the conditions concurrent with the adoption of our invention will necessarily vary, we desire to emphasize that various minor changes in details of construction, proportion and arrangement of parts, may be resorted to within the scope of the appended claims without departing from or sacrificing any of the principles of this invention.

Having thus described our invention, what we desire protected by Letters Patent is as set forth in the following claims, in which we claim:

1. An apparatus for removing surface irregularities from filled cans comprising a recessed die

for receiving the upper half of the circumference of a filled can, means engaging the ends of the can and maintaining the latter in said recess, said means including end plates, means for receiving the lower half of the circumference of the can, and means for elevating and dropping said first mentioned die to impact the lower half of the circumference of said can with said receiving die.

2. An apparatus for removing surface irregularities from filled cans comprising a recessed die for receiving the upper half of the circumference of a filled can, means engaging the ends of the can and maintaining the latter in said recess, said means including adjustable end plates, means for receiving the lower half of the circumference of the can, and means for elevating and dropping said first mentioned die to impact the lower half of the circumference of said can with said receiving die.

3. An apparatus for removing surface irregularities from filled cans, comprising a recessed die for receiving the upper half of the circumference of a filled can, means engaging the ends of the can and maintaining the latter in said recess, said means including end plates, a die for receiving the lower half of the circumference of the can, and means for elevating and dropping said first mentioned die to impact the lower half of the circumference of said can with said receiving die, said means including a manually operated means.

4. An apparatus for removing surface irregularities from filled cans, comprising a recessed die for receiving the upper half of the circumference of a filled can, means engaging the ends of the can and maintaining the latter in said recess, said means including end plates, a die for receiving the lower half of the circumference of the can, and means for elevating and dropping said first mentioned die to impact the lower half of the circumference of said can with said receiving die, said means including a tread operated mechanism.

5. An apparatus for removing surface irregularities from filled cans comprising a die including upper and lower complemental sections adapted to embrace the cylindrical portion of a can, means for engaging the ends of said can and for securing the latter in the upper section of said die, said means including a pair of adjustable end plates simultaneously operable to engage and disengage the ends of said can, means for elevating and dropping the upper section of the die with the can onto said lower section, whereby to generate forces adapted to remove surface irregularities from the can.

6. An apparatus for removing surface irregularities from filled cans comprising a movable die for embracing the upper half of a filled can, end dies adapted to confine the ends of the can, oppositely extending arms connected at one end to said end dies, an arm operating mechanism carried by the movable die and connected to the other ends of said arms operable in one direction to effect clamping engagement with the ends of the can and maintain the can in die confining position and in the opposite direction to release said can, a base die for receiving the non-confined lower half of the can, and means for elevating and releasing said movable die and can, whereby to subject the non-confined portion of the can to sudden impact with the base die.

7. An apparatus for removing surface irregularities from filled cans comprising a base die

adapted to confine one half of a filled can, a complementary upper die adapted to embrace the other half of the can, end dies adapted to engage and confine the ends of the can, arm control means carried by said upper die, oppositely extending arm means connecting said control means and the respective end dies, whereby movement of said control means in one direction effects clamping engagement of the end dies with the ends of the can when the latter is in the upper die confining position, means for automatically locking said dies in clamping position, means for elevating said upper die, said means releasable to permit said die to drop whereby to subject the non-confined portion of the can to sudden impact with the base die.

8. An apparatus for removing surface irregularities from filled cans comprising a base die adapted to confine one half of a filled can, a complementary upper die adapted to embrace the other half of the can, end dies adapted to engage and confine the ends of the can, arm control means carried by said upper die, oppositely extending arm means connecting said control means and the respective end dies, whereby movement of said control means in one direction effects clamping engagement of the end dies with the ends of the can when the latter is in the upper die confining position, means in connection with said arms for varying the adjustable range of said end dies in accordance with cans of different lengths, means for elevating said upper die, said

means releasable to permit said die to drop whereby to subject the non-confined portion of the can to sudden impact with the base die.

9. An apparatus for removing surface irregularities from filled cans comprising a die including upper and lower die sections, each section including means for seating half of a filled can, means for varying the area of the seating means of the respective sections to accommodate different sized cans, means coacting with the upper section for engaging the ends of the can and maintaining it seated in said die, means for elevating the upper section, said means releasable to permit dropping of said die and can whereby to subject the exposed half of said can to sudden impact with the seating means of the lower die section.

10. A filled can straightening device comprising a hollowed-out base die and complementally hollowed-out movable die, each adapted to embrace one half of a filled can, means associated with the movable die for pressingly engaging the ends of the can and maintaining it seated in said die, and means for elevating the movable die and can, said means releasable to precipitate the exposed half of the can into impact with the base die to effect, by the force set up by the impact, the removal of irregularities from the contour of the can.

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