(No Model.) 2 Sheets—Sheet 1.

M. E. HOWARD.

CAN CAPPING MACHINE.

No. 531,634. Patented Jan. 1, 1895.

Fig. 1.

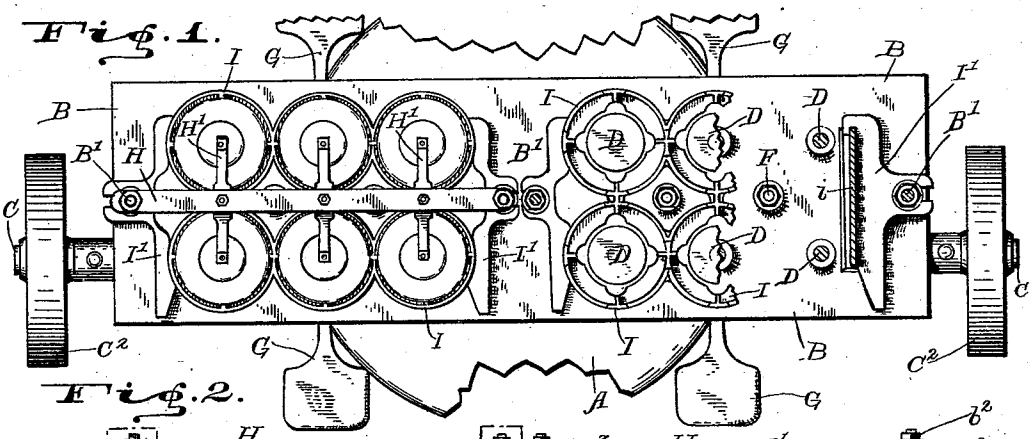

Fig. 2.

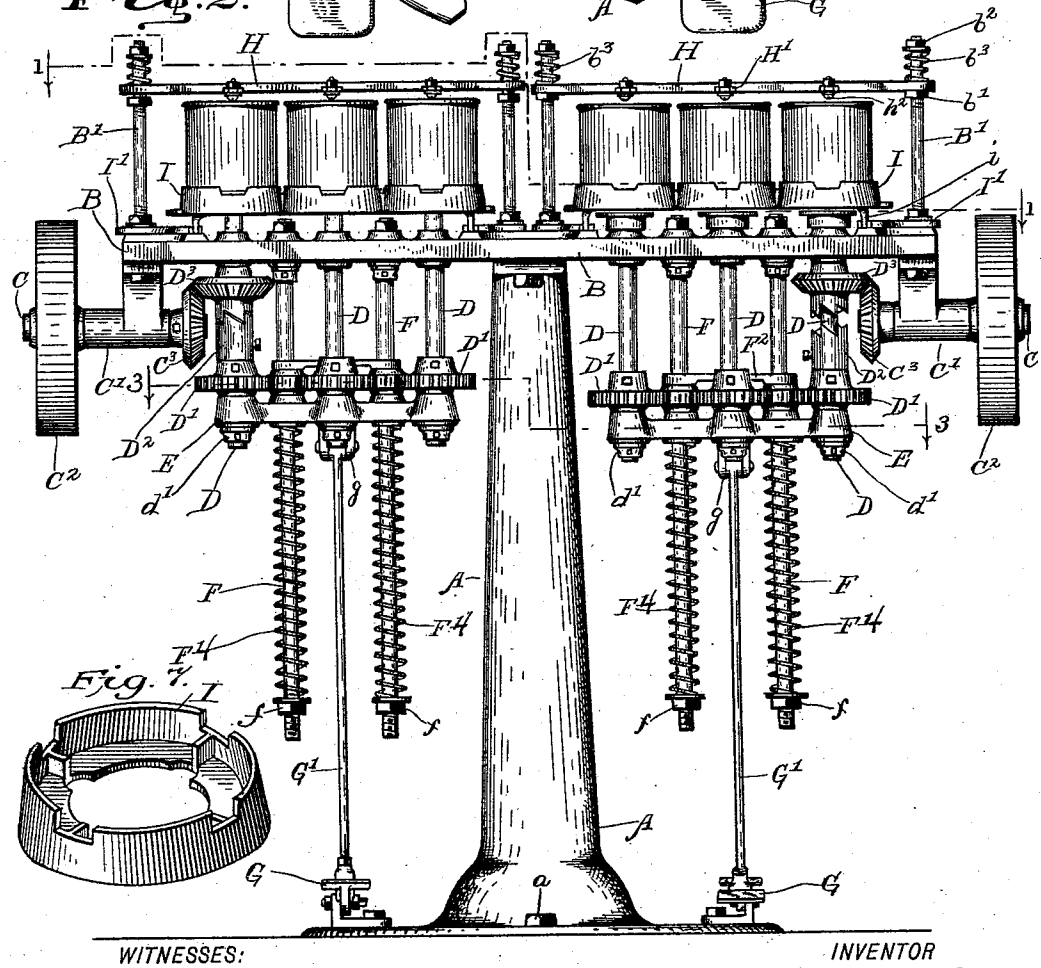

Fig. 7.

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Fig. 3.

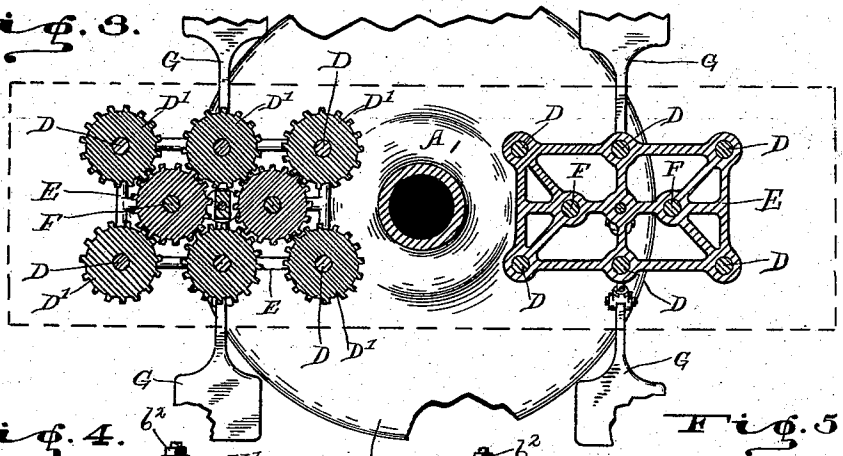


Fig. 4.

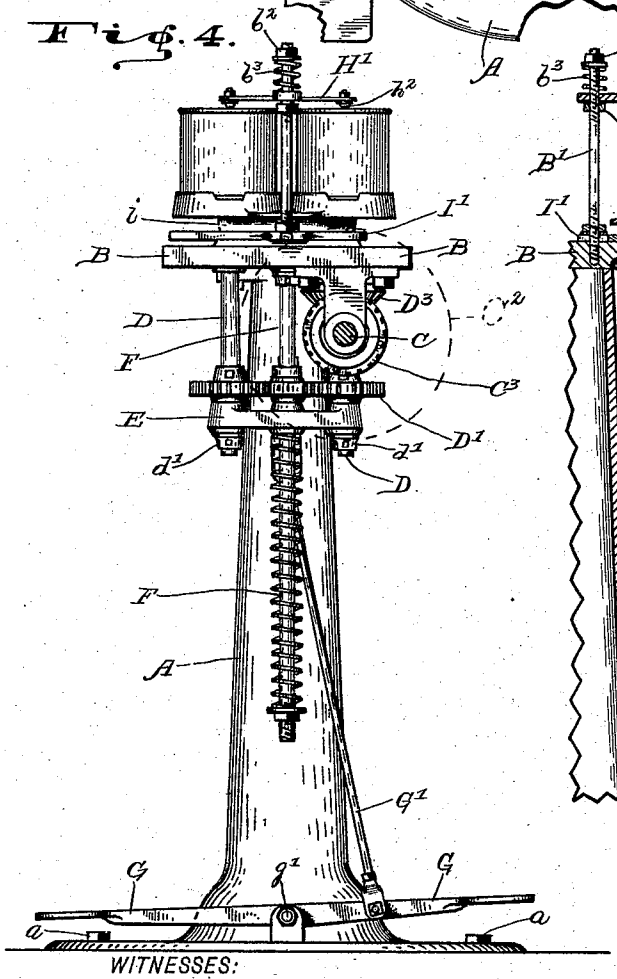


Fig. 5.

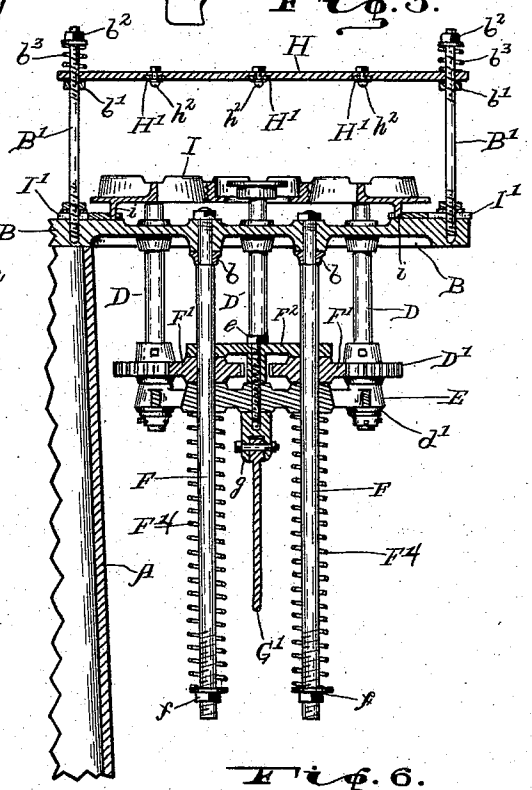
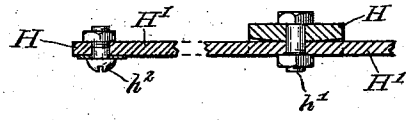


Fig. 6.



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UNITED STATES PATENT OFFICE.

MICHAEL E. HOWARD, OF INDIANAPOLIS, INDIANA.

CAN-CAPPING MACHINE.

SPECIFICATION forming part of Letters Patent No. 531,634, dated January 1, 1895.

Application filed August 18, 1894. Serial No. 520,693. (No model.)

To all whom it may concern:

Be it known that I, MICHAEL E. HOWARD, a citizen of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented certain new and useful Improvements in Can-Capping Machines, of which the following is a specification.

The object of my said invention is to produce a machine for use in soldering the caps on to cans (such as are commonly used in canning edibles), by means of which the cans may not only be expeditiously handled, and the cap securely held in place while being soldered, but which shall be largely automatic in action.

A machine embodying my said invention will be first fully described and the novel features thereof then pointed out in the claims.

Referring to the accompanying drawings, which are made a part hereof, and on which similar letters of reference indicate similar parts, Figure 1 is a view, partly in top plan and partly in horizontal section, of one of my improved can-capping machines, as seen when looking downwardly from the dotted line 1 1 in Fig. 2; Fig. 2, a side elevation of such a machine, the mechanism on one side being shown in engagement, as while the cans are being soldered, and the mechanism on the other side being shown pulled down and out of operative engagement, as when the cans are being placed upon or removed from the machine; Fig. 3, a horizontal sectional view, as seen when looking downwardly from the dotted line 3 3 in Fig. 2; Fig. 4, an end elevation of the machine; Fig. 5, a central sectional view of one side of the machine, the central socket shown being broken out to illustrate the two-size character of said sockets; Fig. 6, a detail sectional view illustrating the construction and method of connection between a can-holding bar and its cross arms, and Fig. 7 a detail perspective view showing, detached, one of the sockets of the can tray, illustrating particularly the two-size character of such socket.

In said drawings the portions marked A represent the supporting standard of my improved machine; B, the table; C, the driving shaft; D, the spindles which rotate the cans; E, a frame carrying said spindles; F, rods upon which said frame is mounted; G, the treadles; H, bars for holding the cans against the thrust of the spindles, and I, trays which carry the groups of cans.

The standard A is preferably in the form of a pillar, arranged centrally of the machine, and having a flanged base by which it may be conveniently secured to the floor, or wherever it is to be placed, by lag bolts *a* or any other desired means. Being central in position, it does not interfere with free access to the mechanism, or with movements of the operatives around the table.

The table B is firmly mounted upon the standard or pillar A, and carries the mechanism. Raised portions thereof are surfaced off, and form bearings for the can-trays and their guides, and it is thickened or provided with bosses in certain other places which form bearings for the spindles D and rods F. Standards B′ thereon carry the can-holding bars H.

The driving shafts C are mounted in sleeve bearings C′, which bearings are firmly secured to the under sides of the table B, and said shafts carry upon the outer ends pulleys C^2, and are thus driven by belts (not shown) from some suitable source of power, and upon the inner end have bevel gear wheels C^3, by which, as will be presently described, the can-carrying spindles are driven.

The can-carrying spindles D are arranged in sets, preferably of six, although, of course, a greater or less number might be employed, and stand vertically, the upper bearings therefor being in the table B, and the lower bearings in the frame E. They are adapted to be moved by said frame, vertically, through the bearings in said table B, and thus raise the cans from the trays or permit them to descend thereon, in operation, as will be hereinafter more fully described. Said spindles are all caused to rotate in one direction by the series of gear wheels D′ mounted thereon, and the loose or idle gear wheels F′ interposed between them and mounted on the rods F, the arrangement being best shown in Fig. 3. One of the spindles, preferably at one corner of the set, carries a clutch part D^2 rigidly secured thereto just above the spur gear wheel D′ thereon, and at the upper end carries a loosely mounted bevel gear-wheel D^3, which,

however, is prevented from descending, when the structure carrying the spindles descends, by the corresponding gear wheel C^3 on the shaft C which engages therewith, as illustrated most plainly in Fig. 2. Thus, while the gear wheel D^3 is in continual rotation, being impelled by the gear wheel C^3, the spindles are only in rotation when raised, as will presently be more fully described. These spindles have flat heads thereon, which heads are above the table B, and come into contact with the bottom ends of the cans, in operation; and, the surface of said heads being considerable, the friction between them and the bottoms of the cans is sufficient to drive said cans without any gripping or clutching devices being provided, and this result is aided by making the buttons h^2, which bear upon the upper ends of the cans, quite small.

The frame E is preferably a single casting, as shown most plainly at the right in Fig. 3, and includes bearings for the various spindles D, and also for the rods F. The spindles D are caused to move vertically with this frame by having collars on each side thereof. The collars on the upper sides are preferably the hubs of the wheel D′, while separate collars d' are provided on the lower sides. The consequence is that this frame, the spindles, and the gears, form what may be termed the "spindle-structure," and this structure moves up and down on the slide rods F, so that the spindles are forced against and operate upon the cans, or are pulled down out of contact with the cans, as may be desired.

The rods F are secured firmly in bearings in the table B, and extend down through bearings in the frame E, passing also through the gear wheels F′ and the yoke F^2;—the latter of which has a central downward projection which passes down between said gear wheels and rests firmly upon the frame E, to which it is secured by the bolt *e*, which also engages with and supports the treadle-rod head *g*, as shown most plainly in Fig. 5;—said bolt *e* thus uniting said several parts strongly and rigidly together. These rods F extend down a considerable distance below the frames E, and carry strong coiled springs F^4, which are supported by means of nuts *f* upon the lower ends of said rods. The tendency of these springs is to constantly force the spindle structure upward, and thus raise the cans and force them against the cross-arms on the bar H, as well as to throw the clutches into engagement and thus set the mechanism in motion, as illustrated at the left of Fig. 2. The force with which this structure and the cans shall be propelled upwardly is easily regulated by means of the nuts *f*. As will be observed in Fig. 5, these rods are turned down and shouldered at the upper ends, where they enter their bearings in the table B, and I prefer to interpose small collars *b* between the shoulders on the rods and the under side of the table, as by this means a better and squarer union may be effected at this point than could otherwise be had with so small a shoulder on the rods.

The treadle G is pivoted at g', preferably to the base of the standard or pillar A, and is preferably double ended, or has a foot-piece upon each end, so that it may be operated from either side of the machine. A rod G′ runs from this treadle to the treadle-rod head *g*, previously described, and is connected to these parts by pivot bolts at the respective ends, as shown most plainly in Figs. 4 and 5. The operation is, when pressing upon one end of the treadle (that shown as raised in Fig. 4) that the spindle structure is pulled down, while a pressure upon the other end of the treadle may be employed, when necessary, in assisting the springs to push the spindle-structure and cans carried thereby up.

The bars H extend across the respective sections of the machine, and are carried at the ends by the standards B′ upon which are nuts b' and b^2 and springs b^3, whereby the connection is rendered an adjustable and yielding one, as will be readily understood. These bars have cross arms H′ which are seated in rocker-shaped bearings in said bars H (see Fig. 6), and are connected to said bars by bolts h';—the rocker-shaped bearing being so that the arms may rock slightly, if necessary, when the cans come in contact therewith, thus securing a more uniform pressure on said cans. These cross-arms are provided at the ends with button-like bearings h^2 which are the devices which come in immediate contact with the can-caps during the operation of the apparatus.

The trays I, are adapted to receive the cans, and are the means whereby the cans are placed upon and removed from the machine. When constructed as shown, each tray has six sockets to receive the cans, the central portions of which are entirely open to permit the ascent of the spindle-heads through them against the bottom of the can. Each socket is also preferably a double socket, one can-seat wherein is smaller than the other, so that each tray is adapted to be used with two different sized cans. Cans of the smaller size provided for are but little larger than the openings in the bottom of the sockets, and such cans rest on the flanges which extend in nearest the spindle-heads, which flanges are illustrated at the right in Fig. 1; while the larger size of cans rest upon the small radial ribs which extend in a little way from the outer rim, and which ribs, while higher than the flanges above mentioned, are not so high as said rim, as also shown. These trays are provided with feet *i*, and can-tray guides I′ are secured upon the standards B′ which guide said feet to position, so that, when the trays are pushed against said guides, the holes in the bottoms of the tray-sockets register with the tops of the spindles, permitting said spindles a free passage through said holes.

The operation is as follows: Two operatives are preferably employed with each machine,

one to place in position and remove the cans, and the other to manipulate the soldering iron. The can-handler preferably stands upon that side of the machine where the treadle is shown as raised, and manipulates the treadle, as well as handles the trays of cans. The solderer stands upon the other side, and does not have to manipulate the treadle, except occasionally where a can does not start to rotating promptly, in which case he presses slightly upon the treadle, thus assisting the springs. It is obvious, of course, that the springs might be so strained as to force the cans into rotation promptly in all cases; but it is better to adjust them so that while rotation generally results, but little more pressure than that needed is employed; and while, therefore, there is generally no need of assisting the springs, it will occasionally happen that a can will not start promptly, in which case the assistance provided for may be promptly rendered, and, after the rotation has commenced there is no further trouble. As heretofore stated, the springs hold the machinery in operative position, and the cans in the position to be operated upon, and thus not only is a more uniform pressure secured upon the cans than can be secured when the force is applied by means of a treadle and against a spring, but less labor is required, as the machines are in operation a greater proportion of the time than they are out of operation. The can-handler having first placed a set of cans upon a tray, presses down upon the treadle, throwing the mechanism out of operation, and slides the tray, bearing the cans, into place. He then simply releases the pressure, which brings the spindle-heads into contact with the bottoms of the cans, forcing them up until they come in contact with the buttons h^2, and setting them in rotation. The solderer then applies his iron, soldering the caps onto the cans of one set. Meanwhile the can handler has placed another set of cans in a similar manner on the other side of the machine, and, while the solderer is attending to these, he removes those which have been soldered, and places another set on the first mentioned side of the machine, and so on, the can handler operating upon one side of the machine, and the solderer upon the other side, alternately and continuously, and the result is that the work is done with great rapidity, while the machine is thrown into and out of operation exactly as desired, and the cans, while the soldering is going on, are under a uniform predetermined pressure.

All the gears, except the driving gear, are, by my arrangement, permitted to be spur gears, which run lightly and easily in engagement with each other, and the apparatus, therefore, requires but little power, while it is also very simple and durable and easily kept in order.

Having thus fully described my said invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination, in a can-capping machine, of the table, slide rods F depending from said table, a spindle-structure mounted upon said slide rods, springs on the lower ends of said rods whereby said structure is impelled upwardly, a treadle connected to said spindle-structure whereby it may be pulled downwardly against the spring force, driving mechanism, and a clutch interposed between said driving mechanism and said spindle-structure, which is thrown into engagement as the spindle-structure raises, and is thrown out of engagement as it is pulled downwardly, substantially as set forth.

2. The combination, in a can-capping machine, of a table, a spindle-structure consisting of a vertically moving frame, a series of vertically set spindles mounted in said table and in said frame, slide rods connected to said table on which said structure is mounted, and a series of intermeshing gears mounted on said spindles and on said rods whereby said spindles are caused to rotate uniformly in one direction, and mechanism whereby said spindles are thrown into and out of operative connection with the driving mechanism.

3. The combination, in a can-capping machine, of a table having bearings therein for the can-carrying spindles and guide-rods, said guide-rods shouldered at the upper end and secured rigidly to the table and provided with interposed washers b, and springs on the lower ends of said rods carrying the spindle-structure, which spindle structure consists of the can-carrying spindles, a connecting frame, and intermeshing gears, substantially as set forth.

4. The combination, in a can-capping machine, of a vertically-moving spindle-structure, springs supporting said spindle-structure and arranged to throw it into raised and operative position, and a treadle connected thereto and adapted to pull it into lower and inoperative position, substantially as set forth.

5. The combination, in a can-capping machine, of the table, standards thereon, bars supported by said standards, and cross-arms on said bars carrying button-bearings on the outer ends to come into contact with the cans, the union between the bars and the cross-arms being rocker-shaped, substantially as set forth.

6. The combination, in a can-capping machine, of the table, standards extending up from said table, bars carried by said standards and having bearings thereon for the upper ends of the cans, said bars being carried between nuts b' and b^2, with springs b^3 interposed between said bars and said nuts b^2, substantially as shown and described.

7. The combination, in a can-capping machine, with the mechanism thereof consisting in part of spindles for supporting and driving the cans, of can-capping trays having openings in the bottoms through which the heads of said spindles will pass, and sockets surrounding the openings for the cans, each

socket being double or two-size in character, whereby two different sized cans can be manipulated by a single tray and each can centered thereon, whether of one size or the other, and the axes of the spindles and the cans carried thereby maintained approximately in line, substantially as and for the purposes set forth.

In witness whereof I have hereunto set my hand and seal, at Indianapolis, Indiana, this 15th day of August, A. D. 1894.

MICHAEL E. HOWARD. [L. S]

Witnesses:
CHESTER BRADFORD,
JAMES A. WALSH.