

Oct. 18, 1960

J. D. McDONALD  
BUN CORING MACHINES

2,956,600

Filed Nov. 19, 1957

2 Sheets-Sheet 1

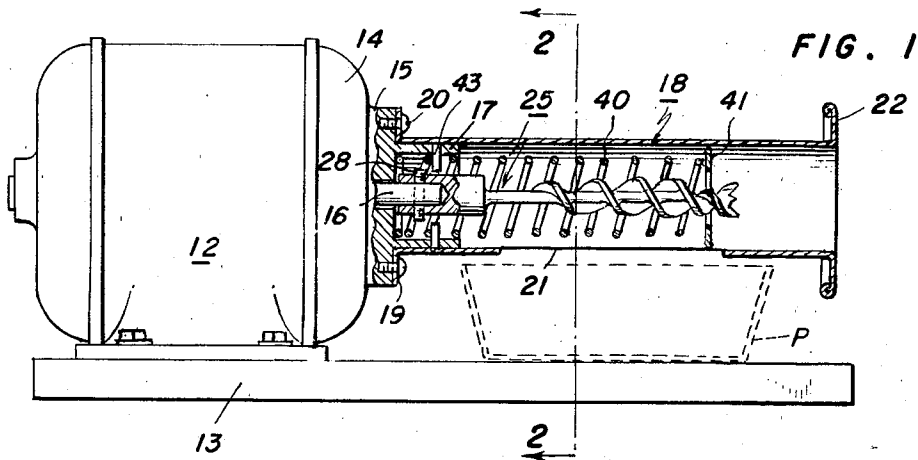


FIG. 2

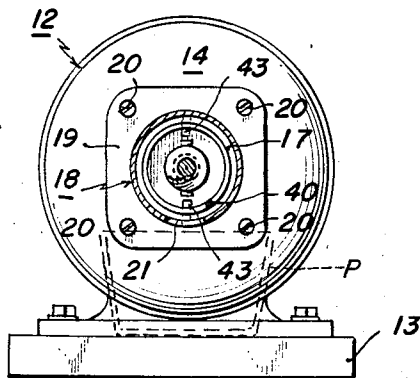


FIG. 3a

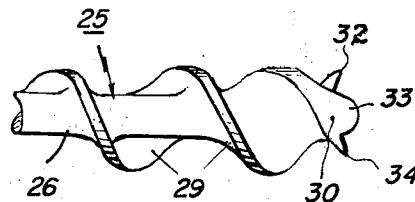


FIG. 3

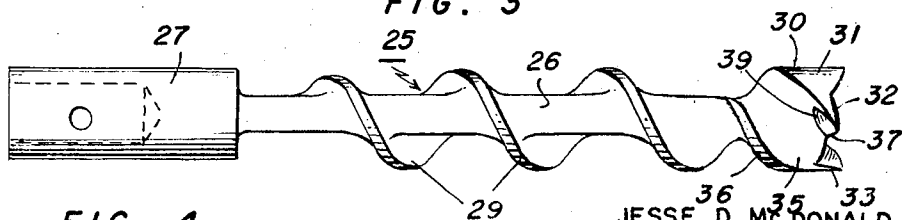
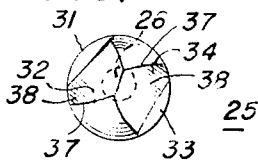


FIG. 4



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2 Sheets-Sheet 2

FIG. 5

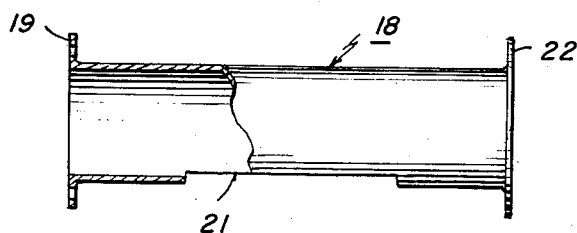


FIG. 6

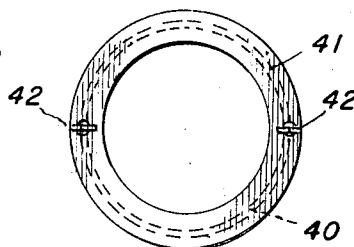


FIG. 7

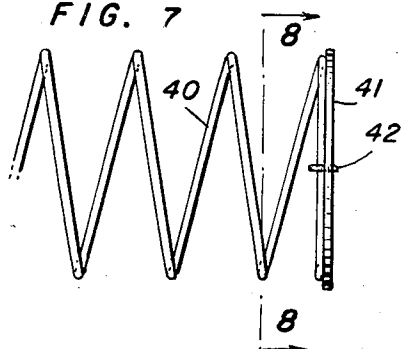


FIG. 8

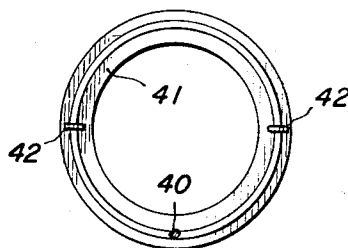


FIG. 9

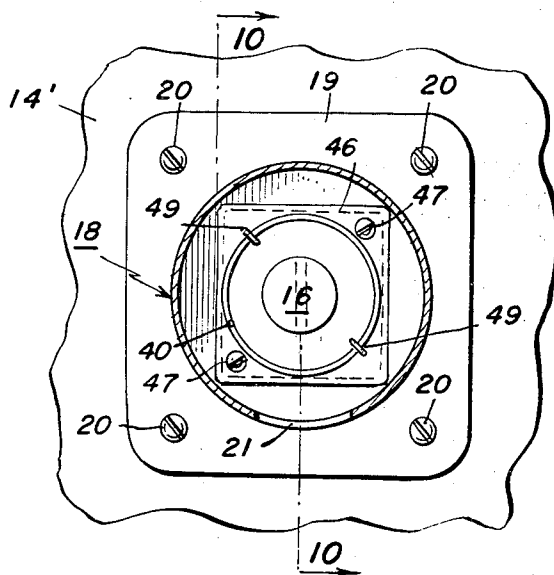
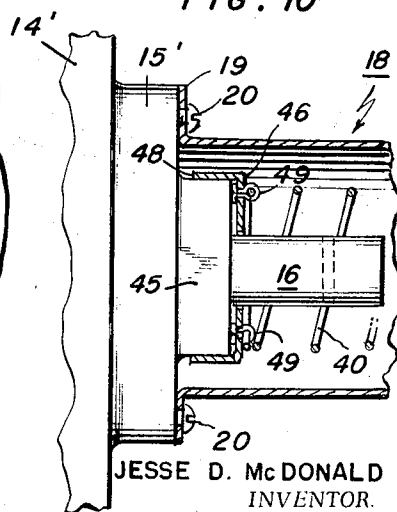


FIG. 10



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## BUN CORING MACHINES

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2 Claims. (Cl. 146—52)

The invention relates to certain improvements in the bun coring machine of the Jesse D. McDonald Patent No. 2,297,158, of September 29, 1942.

In the machine of that patent an electric motor fastened to a base has a boring tool fixed to its shaft and disposed centrally in a bun receiving and guiding tube, the latter having one end fastened to the casing of the motor and its free end supported by a bracket on the base.

The objects of the present invention are to provide such a machine with an ejector means which will assist the operator in removing a bored bun from the guiding tube, to provide a more effective core cutting and removing means so that there will be no tendency of the bun being torn or of the crumbs clogging up the machine while in operation, and to generally improve both the construction and operation of the machine.

With the above and other objects and advantages in view, the invention resides in the novel combinations and arrangements of parts and the novel features of construction hereinafter described and claimed, and illustrated in the accompanying drawings which show the present preferred embodiments of the invention.

In the drawings:

Fig. 1 is a side view of the machine with the improved parts in longitudinal section;

Fig. 2 is a vertical transverse sectional view taken on the line 2—2 in Fig. 1;

Fig. 3 is an enlarged side view of the improved boring auger or bit;

Fig. 3a is a detail side of the cutting end of the tool looking at it from a 90° angle from the plane of Fig. 3;

Fig. 4 is an end view of the cutting bit;

Fig. 5 is a side view of the bun guiding tube with parts broken away and in section;

Fig. 6 is an outer end view of the bun ejector ring on an enlarged scale;

Fig. 7 is an enlarged side view of the outer portion of the ejector spring with the ring fastened thereto;

Fig. 8 is an enlarged detail section taken on line 8—8 in Fig. 7;

Fig. 9 is a detail transverse section similar to a portion of Fig. 2, but on a larger scale, showing a modified form of fastening for the inner end of the ejector spring; and

Fig. 10 is an enlarged detail section taken on line 10—10 in Fig. 9.

Referring more in detail to the drawings, the numeral 12 denotes an electric motor which may be fastened to a table or other support, or as shown, fastened to a portable base 13 near one of its ends so that a crumb receiving pan P may be supported on its other end portion.

In the embodiment shown in Figs. 1 and 2, one of the end plates 14 of the casing of the motor is formed with a rectangular boss or projection 15 through the center of which projects the armature shaft 16 of the motor. The enlargement 15 has a flat outer face from which projects a reduced hollow cylindrical extension 17 which surrounds and is concentric with the shaft.

The numeral 18 denotes as a whole a guiding tube for the elongated roll or bun to be cored. It is a cylindrical tube of a diameter to fit on the tubular boss 17 and to be effectively supported thereon. At such telescoped inner end of the tube is formed a radially projecting flange 19 adapted to abut and to be fastened to the flat face of the enlargement 15 by a plurality of machine screws 20, as seen in Figs. 1 and 2. The tube 18 may thus be supported entirely from the end plate of the motor and may be easily removed and replaced. If a base 13 is used, the tube will be disposed over its pan supporting portion, and in that part of the tube is formed a longitudinally extending opening or slot 21 for the discharge of crumbs. At the outer or free end of the tube is preferably formed a radially projecting annular finger guard 22.

The numeral 25 denotes as a whole a combined boring tool and crumb conveyor which may be fixed in any suitable manner to the motor shaft 16 and which is centrally disposed in the guiding tube 18. It comprises a central stem 26 having at one end a bun cutting or boring bit and at its other end a cylindrical enlargement or shank 27 formed with a socket to receive the shaft 16 so that it may be fastened thereto by a set screw 28 or equivalent means. Extending along a substantial length of the stem 26 from the cutting bit is an integrally formed spiral web 29 which serves as a crumb conveyor. At the outer end, this web is formed with an enlarged portion 30 shaped to provide on one side of the axis of the tool two cutting fingers or blades 31 and 32. Similar cutting blades 33 and 34 are formed on an enlargement 35 at the other side of the outer end of the tool, and that enlargement is at the end of a short spiral rib or web 36, as seen in Fig. 3. This short spiral web is about midway of the enlargement 30 and the adjacent turn of the web 29 and its rear end merges into the stem as seen in Fig. 3. The outer faces of the diametrically opposed blades 31 and 33 extend circumferentially and determine the diameter of the bore or socket cut in the bun, their inner faces being inclined inwardly and rearwardly from the curved cutting edges of the blades. The similarly opposed cutting blades 32 and 34 cut the core into pieces so that the conveyor web or spiral 29 will effectively move such pieces or crumbs rearwardly and cause them to fall through the tube slot 21 and drop into the pan as the bun is pushed by hand into the tube and against the cutting bit of the tool. These blades 32 and 34 have cutting edges 37 which extend inwardly from the peripheral portions of the respective enlargements 30 and 35 at the advancing sides or ends of the blades 31 and 33, to points at opposite sides of the stem 26; and those sharp cutting edges are formed by the flat but rearwardly inclined front faces 38, as seen in Fig. 4 and by notches or channels 39 formed in the rear faces of the blades 32 and 34.

For the purpose of facilitating the removal of the cored or socketed bun from the tube 18, a spring actuated ejector is arranged in the tube around the cutter tool 25. This bun ejector means comprises a coil spring 40 and a bun-engaging ring or follower 41. The latter is a flat circular ring having an outer diameter sufficiently less than the internal diameter of the tube 18 to permit free sliding of the ring and an inner diameter substantially greater than the outer diameter of the cutting tool and its web. The ring may be fastened to the outer end of the spring by wire fasteners 42 passed around the end coil of the spring with their ends passed through holes in the ring and then bent in the manner of cotter pins. The spring may have its inner end anchored in any suitable manner to the inner end portion of the tube 18 or to the motor housing or casing. As shown in Figs. 1 and 2 that end of the spring is disposed in the tubular boss

17 and retained therein by diametrically arranged pins 43 in the boss and projecting inwardly between coils of the spring. It will be noted on reference to Fig. 1 that the coils of the spring are widely separated to provide large spaces through which the crumbs may pass. That spacing is reduced as the spring is compressed but the movement of the coils as the cored bun is ejected will tend to dislodge any crumbs within or on the coils of the spring.

The modified form shown in Figs. 9 and 10 is the same in construction and operation as the form above described with the exception of the manner of fastening the inner end of the spring and the inner end of the bun guiding tube. In these views the motor end plate 14' has a square enlargement 15' with a flat outer face against which the flange 19 of the tube 13 is fastened by screws 20, but instead of having a cylindrical boss to telescope into the tube, it is formed with a smaller rectangular boss 45 through which the motor shaft extends. The spring 40 may be fastened to the boss 45 by means of a square or rectangular cap plate 46 fastened to the boss by two machine screws 47 as seen in Fig. 9. The flanges 48 of the plate 46 engage the sides of the boss and the plate has a central opening through which the shaft extends. The endmost coil of the spring is fastened to the plate by cotter-pin-like wire fasteners 49, as seen in Fig. 10.

The operation of the machine will be apparent from the foregoing detailed description, but it may be noted that after the cutter 25 has been fastened to the motor shaft, the spring may be placed over the cutter and its end fastened, and then the tube may be telescoped over those parts and fastened to the motor casing. The parts may thus be quickly and easily assembled and disassembled for cleaning or repairs. The manner of fastening the bun guiding tubes to the motor provides a strong and rigid support for the tube. The cutting bit prevents the bun from being torn and severs the core into small pieces that are effectively moved rearwardly where they fall into the coil spring and then through its coils. The simple bun ejector means not only prevents the bun from sticking in the guiding tube but assists in the discharge of crumbs into the pan as above explained.

From the foregoing, taken in connection with the accompanying drawing, it will be seen that novel and advantageous provision has been made for carrying out the objects of the invention, and while preferences have been disclosed, attention is invited to the possibility of making variations within the scope of the invention as claimed.

What is claimed is:

1. In a bun coring machine having a bun receiving and guiding tube fixed to and projecting from the casing of a motor concentric with the horizontal shaft of the latter, said tube having in its bottom a longitudinally extending crumb discharge slot, and a rotary coring tool having a stem disposed centrally in the tube and fixed to the motor shaft, said tool stem having at its front end cutting means to core the bun and sever the core into crumbs; means for both ejecting a cored bun from said tube and facilitating the movement of the crumbs to said slot, the last mentioned means comprising a spiral crumb-conveying web extending longitudinally along the tool stem from said cutting means rearwardly, the length of said web being substantially coextensive with the length of the slot, a bun-ejecting and crumb-moving ring in said tube having an outside diameter slightly less than the inside diameter of said tube and an inner diameter substantially greater than the diameter of said tool and its spiral web, a coil spring with widely spaced convolutions in said tube and normally extending over substantially the entire length of said slot, the rear end of said spring being anchored, means fastening the front end of said spring to said ring to support the latter for sliding movement in the tube and to normally position the ring above the front end portion of the slot and slightly in rear of the cutting means of the tool, said cutting means to core the bun and

sever the core into crumbs comprising opposed enlargements at the outer ends of the spiral webs formed on the stem of the tool, one of the last mentioned webs being said crumb-conveying web, each of said last mentioned enlargements having an outer circumferentially extending cutting blade which determines the diameter of the core or socket cut in the bun, and an inner blade disposed between the adjacent outer blade and the stem of the tool to sever the cut core of the bun into crumbs, said inner blades having cutting edges extending in a substantially radial direction and with their front faces flat and rearwardly inclined and their rear faces formed with notches, whereby when a bun is pushed by hand into the tube, the ring will be moved rearwardly to compress the spring as the cutting means cuts the core and severs it into crumbs, and the latter will be conveyed by the web rearwardly until they drop onto the lower portion of the convolutions of the spring and from the latter to the slotted bottom portion of the tube, the rearward movement of the ring causing the crumbs on the bottom portion of the tube to be discharged through the slot, the movement in both directions of the convolutions of the spring facilitating the downward discharge of the crumbs.

2. A bun coring machine comprising a motor with a casing having an end plate with a projecting enlargement having a flat face and a shaft projecting horizontally through the latter, a rotary boring tool having a stem with its inner end fixed to said shaft and its projecting portion provided with means to cut a core from a bun and sever it into crumbs, a crumb conveying web extending spirally around the stem of said tool from its cutting means rearwardly, a bun receiving and guiding tube surrounding said tool and formed with an outwardly projecting flange disposed in contact with said flat face, said tube having in the bottom of its intermediate portion an elongated crumb discharge slot, means detachably fastening said flange to said flat face, a bun-ejecting and crumb-moving ring within said tube, said ring having an external diameter slightly less than the internal diameter of said tube and an internal diameter substantially greater than the diameter of said tool and its crumb-conveying web, a coil spring in said tube surrounding said tool in spaced relation thereto, means fastening the outer end of said spring to said ring to support the latter for sliding movement in said tube and above said slot, and means fastening the inner end of the spring to said enlargement, the convolutions of said spring being widely spaced, whereby crumbs conveyed rearwardly by said tool will pass through the spring convolutions and be discharged through said opening, bun cutting means on the projecting portion of the tool comprising opposed enlargements at the outer ends of spiral webs formed on the stem of the tool, one of the last mentioned webs being said crumb-conveying web, each of the last mentioned enlargements having an outer circumferentially extending cutting blade which determines the diameter of the core or socket cut in the bun, and an inner blade disposed between the adjacent outer blade and the stem of the tool to sever the cut core of the bun into crumbs, said inner blades having cutting edges extending in a substantially radial direction and with their front faces flat and rearwardly inclined and with their rear faces formed with notches.

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