Feb. 21, 1933. W. D. BLEIER 1,898,653

TIN CLEANING AND GREASING MACHINE

Filed June 7, 1930 2 Sheets-Sheet 1

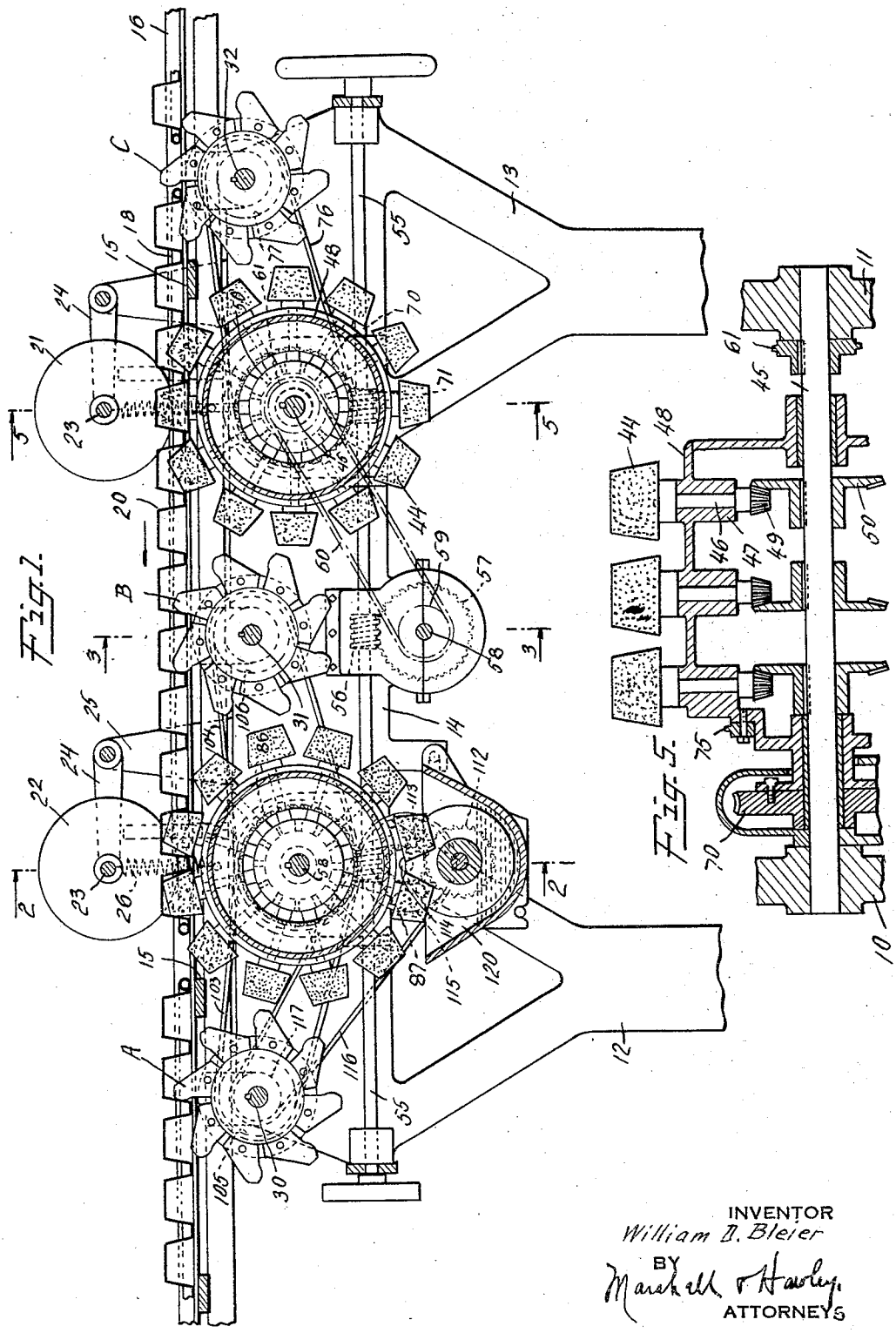


Fig. 1.

Fig. 5.

INVENTOR
William D. Bleier
BY
Marshall & Hawley
ATTORNEYS

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Fig. 2.

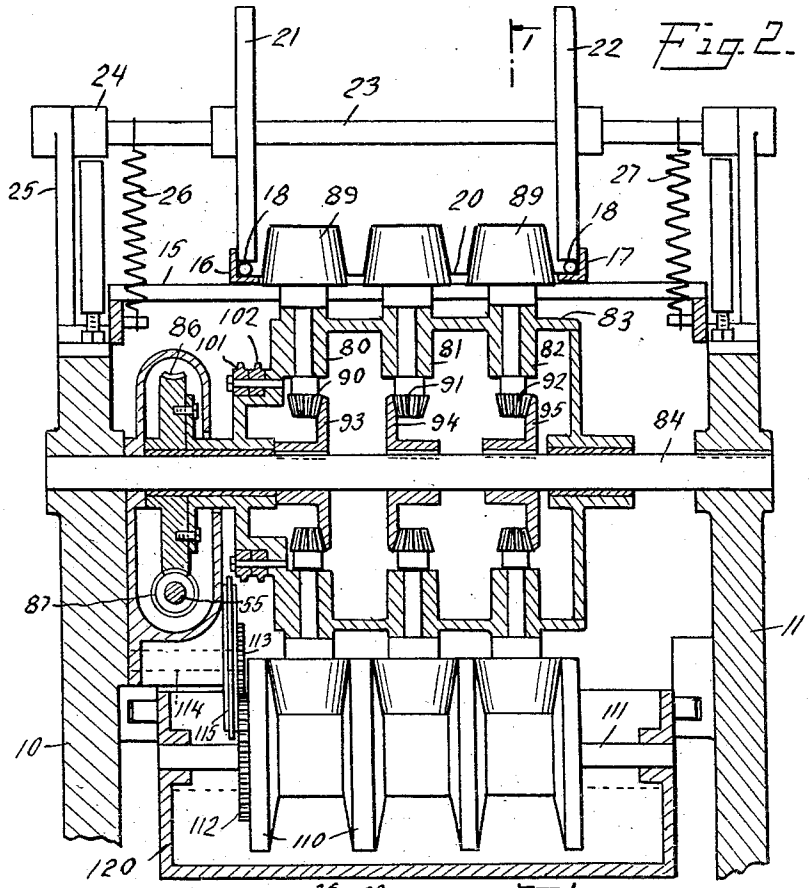


Fig. 3.

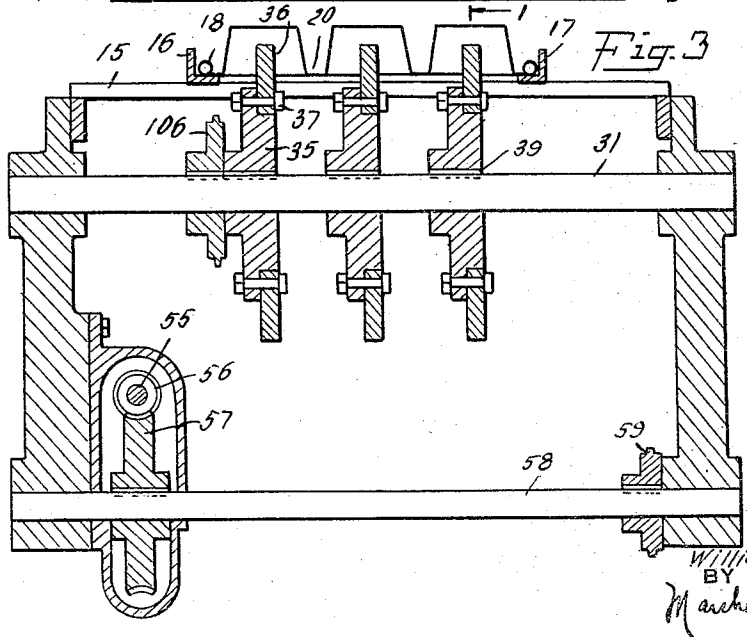
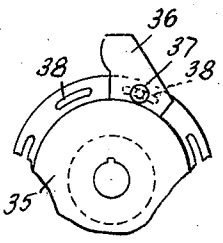


Fig. 4.



INVENTOR
William D. Bleier
BY
Marshall & Hawley.
ATTORNEYS

Patented Feb. 21, 1933 1,898,653

UNITED STATES PATENT OFFICE

WILLIAM D. BLEIER, OF NEW YORK, N. Y., ASSIGNOR TO CONTINENTAL BAKING COMPANY, OF NEW YORK, N. Y., A CORPORATION OF DELAWARE

TIN CLEANING AND GREASING MACHINE

Application filed June 7, 1930. Serial No. 459,636.

This invention relates to machines for cleaning and greasing baking tins.

In large bakeries a very considerable amount of time and labor are required for cleaning baking tins of the type used for baking small articles, such as cup cakes, muffins, etc., and for greasing such tins.

This invention has for its salient object to cut down the time required for the functions above set forth and to provide a machine constructed and arranged to efficiently and quickly perform said functions.

Another object of the invention is to provide a machine of the character described that is simple and practical in construction, efficient in operation, and can be economically manufactured.

Further objects of the invention will appear from the following specification taken in connection with the drawings, which form a part of this application, and in which

Fig. 1 is a vertical sectional elevation of a machine constructed in accordance with the invention, this view being taken substantially on line 1—1 of Fig. 2;

Fig. 2 is a sectional elevation taken substantially on line 2—2 of Fig. 1;

Fig. 3 is a sectional elevation taken substantially on line 3—3 of Fig. 1;

Fig. 4 is a fragmentary elevational view showing the details of construction of one of the tin feeding members; and

Fig. 5 is a sectional elevation taken substantially on line 5—5 of Fig. 1.

The invention briefly described consists of a machine comprising means for feeding baking tins, means adapted to engage and clean the tins as they are fed, and means for greasing the tins after they have been cleaned. The tin feeding means is constructed and arranged to feed the tins continuously and the cleaning and greasing means are so coordinated in their movements with the feeding means that they will effectively engage the pockets in the tins and thoroughly clean and grease the pockets as the tins are fed.

Further details of the invention will appear from the following description.

In the particular embodiment of the invention illustrated, the machine comprises side frames 10 and 11, each side frame in turn comprising upright frame members or pedestals 12 and 13 and a longitudinally extending connecting frame 14.

The two side frames 10 and 11 are connected by cross slats 15 which support L-shaped guide rails 16 and 17, which in turn are adapted to receive and support the longitudinal side edges 18 of the baking tins 20. The tins are held in position during their feeding movement by two sets of disks 21 and 22. Each set of disks is carried by a shaft 23 mounted in arms 24 pivoted on fixed brackets 25 carried by the machine frame. The shafts 23 are engaged by springs 26 and 27 which tend to pull the shafts downwardly and press the disks 21 and 22 into engagement with the beads on the outer edges 18 of the tins.

The tins 20 are fed by a plurality of sets of wheels A, B and C. These sets of wheels are mounted respectively on shafts 30, 31 and 32. Each set of wheels, in the form of the invention illustrated, comprises three exactly similar feeding wheels and each wheel consists of a disk 35 having adjustably mounted thereon a plurality of peripherally extending lugs 36. In Fig. 4 the lugs are shown as secured to the disk by bolts 37 which are carried by the disk and extend through slots 38 in the lugs. The disks are keyed to the shafts, as shown at 39, in Fig. 3.

The lugs 36 are so shaped and are so spaced as to extend into the pockets or receptacles formed in the tins in the manner clearly shown in Fig. 1.

The brushing and cleaning mechanism comprises in the embodiment of the invention shown, three sets of brushes adapted to enter the three sets of pockets or receptacles formed in the tins.

In Figs. 1 and 5 the cleaning brushes 44 are shown as extending radially with reference to a shaft 45, the brushes being carried by the shafts 46 rotatably mounted in journal bosses 47 formed in a casing or drum 48. Each shaft 46 has a bevel gear 49 on its

inner end which meshes with a bevel gear 50 mounted to rotate with the shaft 45.

The main power or drive shaft for the machine is shown at 55 in Fig. 1 and is driven from any suitable source of power. The shaft 55 has mounted thereon a worm 56 which meshes with a worm gear 57 carried by a shaft 58. The shaft 58 has a sprocket wheel 59 secured thereto, driven by the worm gear 57 and connected by a sprocket chain 60 to drive a sprocket wheel 61 which is fixed to the shaft 45. Three bevel gears 50 are mounted on and driven by shaft 45, one for each set of brushes.

The casing or drum 48 is rotatably mounted on the shaft 45 and has connected thereto a worm wheel 70 which is driven by a worm 71 mounted on the shaft 55. A sprocket wheel 75 is also rotatable with the drum 48 and worm wheel 70. Wheel 75 is connected by a chain 76 to drive a sprocket wheel 77 mounted on the shaft 32 of the feed wheels C.

It will be obvious from an inspection of the driving connections shown in Fig. 1 that the brush shafts 46 will be driven by the bevel gears 50 at a much faster rate of speed than the rate of feeding movement of the tins.

From the above description it will be seen that as the tins are fed by the three sets of feeding wheels A, B and C, the brushes 44 will enter the pockets or recesses in the tins and by means of their rapid rotation therein thoroughly remove from the pockets all extraneous matter therein left over from a previous use of the tins.

After the tins have been cleaned by the brushes 44 they are greased in the manner which will now be described. In Fig. 2 there is shown three sets of bosses 80, 81 and 82 which are carried by a casing or drum 83 rotatably mounted on a fixed shaft 84. The casing or drum 83 is connected to and driven by a worm gear 86 and worm 87 from the shaft 55. Each of the sets of bosses 80, 81 and 82 carries a plurality of radially extending shafts 88, on the outer ends of which are mounted brushes 89. The three sets of brush shafts 88 have secured to the inner end thereof, bevel gears 90, 91 and 92 which mesh with bevel gears 93, 94 and 95 fixed on the shaft 84. The gear 94 faces in a direction opposite to the gears 93 and 95 and the center set of brushes will, therefore, rotate in a direction opposite to the direction of rotation of the other two sets of brushes.

The drum 83 is thus driven from the shaft 55 by means of the worm and worm gear connection 87, 86 to rotate the disks 80, 81 and 82 and as the casing or drum 83 is rotated the brushes 89 carried thereby are driven by means of the bevel gear connections described since the gears 93, 94 and 95 are stationary. Should the bristles on the two outer sets of brushes be laid over or flattened by use, they can be transferred to the center set, whereupon the opposite rotation will cause them to be straightened up. Also, the bristles in the brushes of the center set can be similarly straightened.

The shafts 30 and 31 for the tin feeding wheels or disks A and B are driven by sprocket and chain connections with the casing or drum 83. Casing 83 has a pair of sprocket wheels 101 and 102 secured thereto. These wheels have mounted thereon chains 103 and 104 by means of which they are connected to drive sprocket wheels 105 and 106 carried by the shafts 30 and 31.

The grease for greasing the tins is first applied to the brushes 89 and is applied by the brushes to the tins. The brushes 89 receive the grease from oppositely facing conical disks 110 carried by the shaft 111. This shaft has mounted thereon a gear 112 which meshes with a gear 113 mounted on jack shaft 114 on which is also mounted a sprocket wheel 115. The wheel 115 is driven by a chain 116 from the sprocket wheel 117 carried by the shaft 30.

The disks 110 rotate in a receptacle 120 having grease therein and, as shown in Fig. 1, dip into the grease during a portion of their rotation. As the brushes 89 pass between the oppositely facing conical disks and rotate in contact therewith, they receive grease from the disks, and during their rotation in the pockets or receptacles formed in the tin, the brushes transfer the grease to the tin. Attention is called to the fact that the brushes 89 rotate at a much slower rate of speed on their axes than do the brushes 45 which clean the tins.

The rate of rotation of the brush drums or casings 48 and 83 and the arrangement of the sets of brushes radially on these shafts are so worked out that the brushes will enter the pockets, perform their functions, and leave the pockets during the feeding movement of the tins by the tin feeding mechanisms A, B and C. Furthermore, the brushes 89 are so driven as to receive and deposit on the tins a relatively thin film of grease.

From the foregoing description it will be seen that the machine described will operate continuously without attention to thoroughly and efficiently clean and grease baking tins of the type specified. It will be understood that as many sets of cleaning and greasing brushes may be provided as are necessary to clean and grease all of the pockets or receptacles formed in the tins.

Although one specific embodiment of the invention has been particularly shown and described, it will be understood that the invention is capable of modification and that changes in the construction and in the ar-

rangement of the various cooperating parts may be made without departing from the spirit or scope of the invention, as expressed in the following claims.

What I claim is:

1. In a machine of the character described, means for feeding baking tins having pockets therein, said tins being fed in a substantially straight path, a plurality of brushes, means for moving said brushes in a predetermined path into coaction with said tins and into and out of said pockets during the feeding movement of the tins, and means for axially rotating said brushes during their coaction with said tins.

2. In a machine of the character described, means for feeding baking tins in a substantially straight path, a plurality of brushes, means for moving said brushes in a predetermined path, means for synchronizing and coordinating the feeding movement of the tins and the movement of the brushes to bring the brushes into coaction with said tins during the feeding movement thereof, and means for axially rotating said brushes during their coaction with said tins.

3. In a machine of the character described, means for feeding baking tins having pockets therein in a substantially straight path, and means operative on the tins during their movement by said feeding mechanism for cleaning said tins, said cleaning means comprising brushes movable into and out of said pockets.

4. In a machine of the character described, means for feeding baking tins in a substantially rectilinear path, a plurality of brushes, means for moving said brushes in a rotary path intersecting the path of movement of the tins and into coaction with said tins, and means for axially rotating said brushes during their coaction with said tins.

5. A machine for cleaning tins comprising spaced tin supporting members, means for feeding tins having pockets therein along said members, yielding means for holding the tins over said members, and means including brushes operative on the tins and movable into and out of said pockets during their movement by said feeding mechanism.

6. In a machine of the character described, a plurality of sets of mechanism adapted to feed baking tins having a plurality of pockets therein, each set comprising a plurality of feeding wheels disposed side by side and having projections adapted to enter the pockets in the tins, and means adapted to enter and clean said pockets as the tins are fed.

7. In a machine of the character described, a plurality of sets of mechanisms adapted to feed baking tins having a plurality of pockets therein, each set comprising means adapted to enter the pockets in said tins, and rotatable means movable in a predetermined path and adapted to enter and clean said pockets as the tins are fed, the movement of the cleaning means and feeding means being synchronized.

8. In a machine of the character described, means for feeding baking tins, and means for cleaning the tins, said cleaning means comprising a shaft, a plurality of brushes having axes disposed radially with reference to and supported by said shaft, means for moving said brushes in a circular path about said shaft, said tins being movable in a path substantially tangential to the path of movement of the brushes and means for axially rotating said brushes.

9. In a machine of the class described, means for feeding baking tins having a plurality of pockets therein, said means including members successively engageable with said pockets, means comprising brushes arranged to enter said pockets as the tins are fed, and means for moving the brushes into and out of said pockets, and means for synchronizing the movement of the brushes with the movement of said feeding members.

10. In a machine of the character described, means for feeding a plurality of baking tins having pockets therein, and means comprising a plurality of brushes movable in a curved path into and out of said pockets, means for moving said brushes in said curved path, said tins being movable by said feeding means in a path substantially tangent to the path of the brushes.

11. In a machine of the character described, continuously operating feeding means for feeding baking tins having pockets therein, means comprising a plurality of brushes movable in a circular path and movable successively into and out of said pockets as the tins, are fed means for moving said brushes in said path, and means for rotating said brushes.

12. In a machine of the character described, means for feeding baking tins having pockets and in a substantially straight path, a shaft parallel to the plane of movement of said tins, brushes disposed radially around said shaft and movable into and out of said pockets, and means for rotating said shaft in synchronism with the movement of said tins.

13. In a machine of the character described, means for feeding baking tins, means operative on said tins during their feeding movement, said means comprising a plurality of brushes movable in a path intersecting the path of movement of the tins and axially rotatable during the operation of the brushes on the tins, means for moving said brushes in said path, and means for rotating said brushes.

14. In a machine of the character de-

scribed, a plurality of sets of mechanisms adapted to feed baking tins having a plurality of pockets therein, each set comprising a plurality of feeding wheels disposed side by side and having projections adapted to enter the pockets in the tins, and a brush arranged to enter and clean each pocket as the tins are fed.

WILLIAM D. BLEIER.