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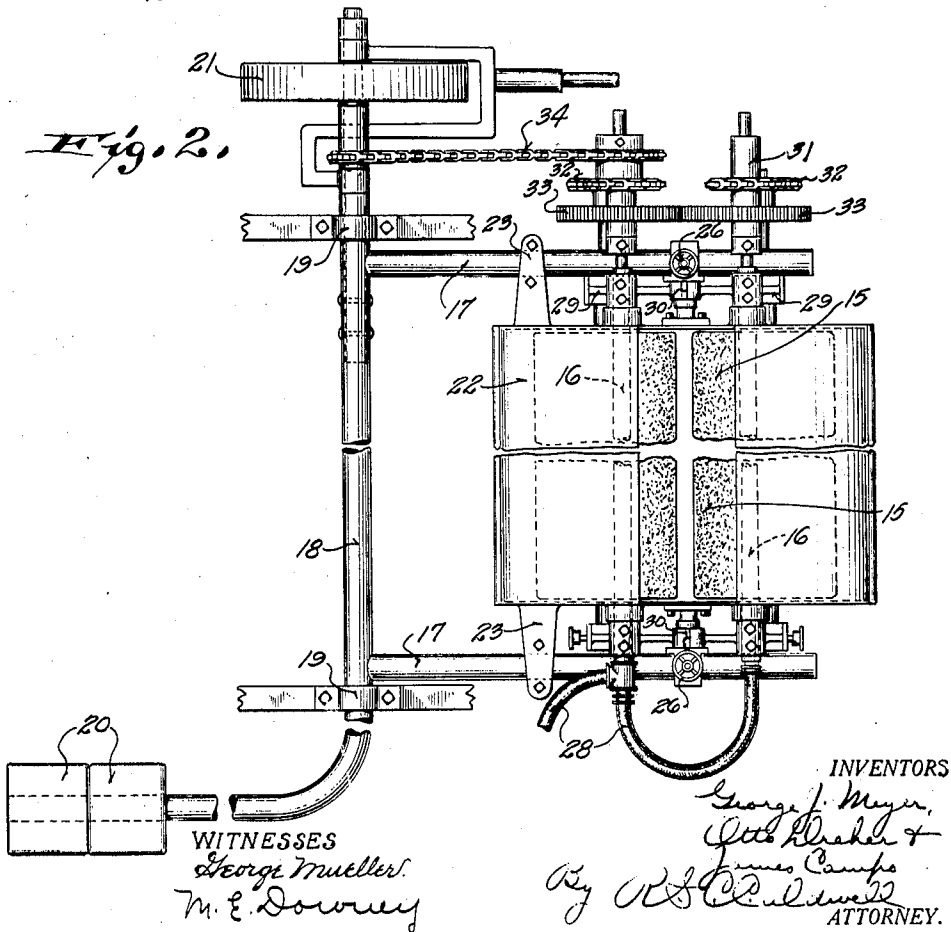
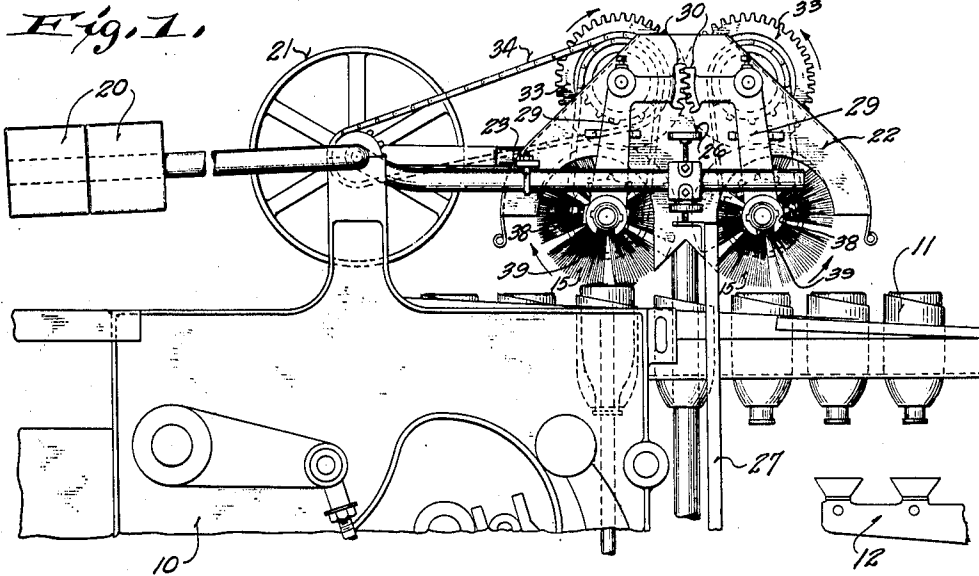
G. J. MEYER ET AL

1,817,014

SWINGING OUTSIDE BRUSH FOR BOTTLE WASHING MACHINES

Filed Feb. 9, 1925

3 Sheets-Sheet 1



WITNESSES
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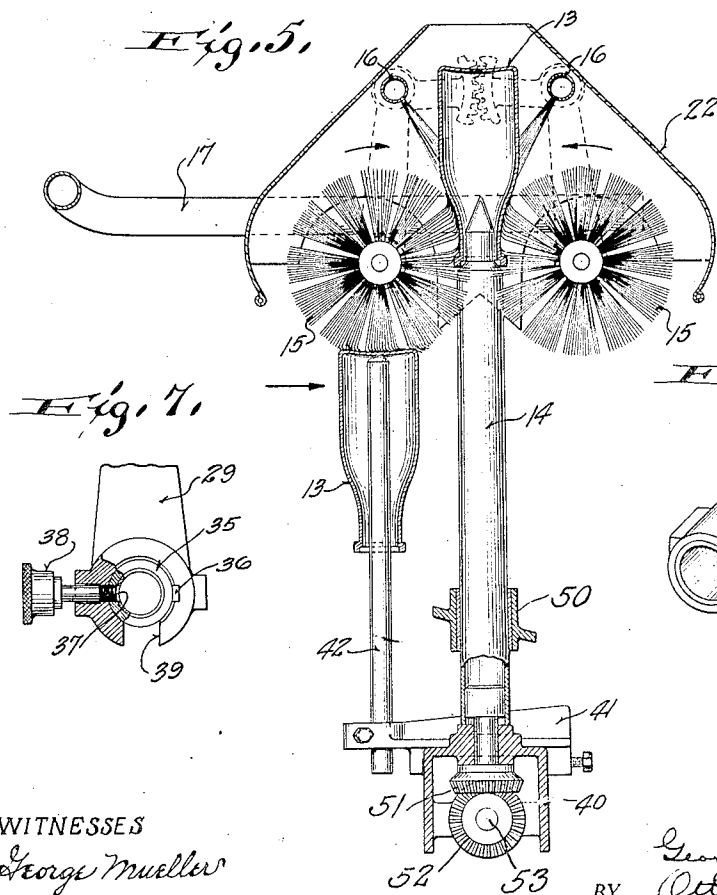
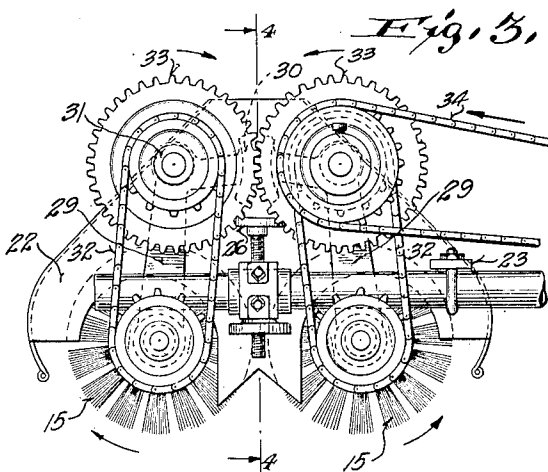
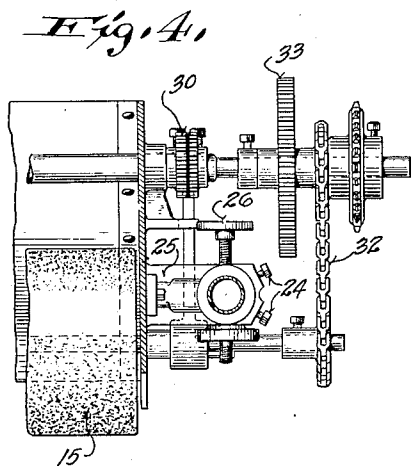
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SWINGING OUTSIDE BRUSH FOR BOTTLE WASHING MACHINES

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3 Sheets-Sheet 2



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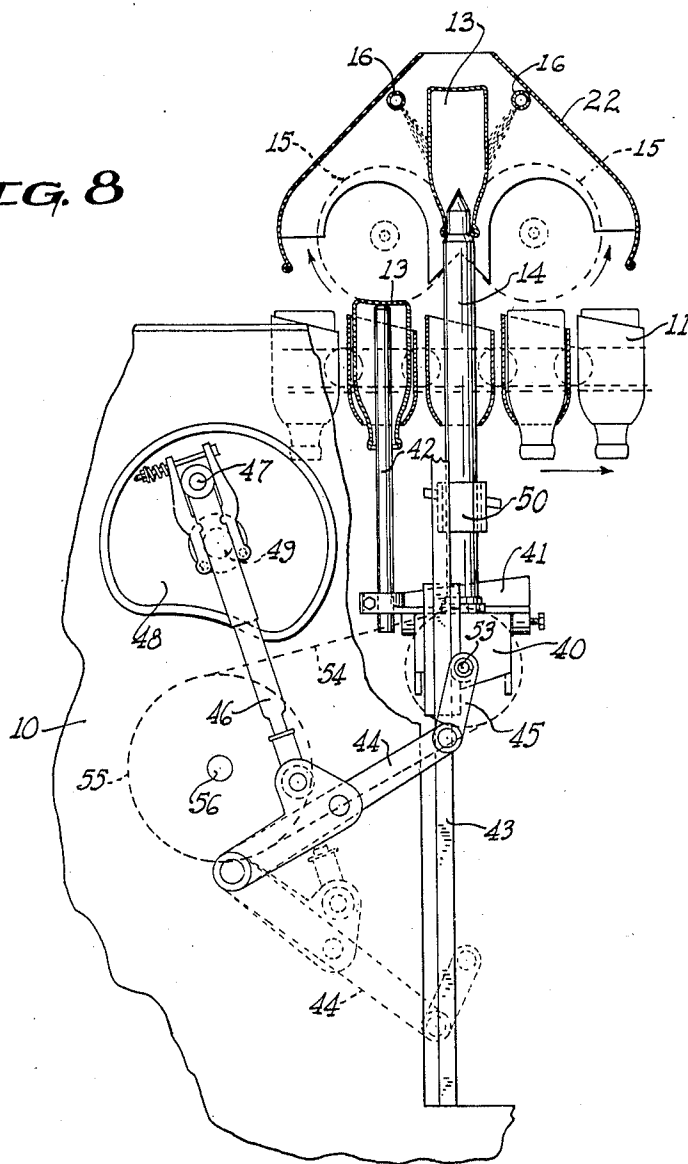
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SWINGING OUTSIDE BRUSH FOR BOTTLE WASHING MACHINES

Filed Feb. 9, 1925

3 Sheets-Sheet 3

FIG. 8



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SWINGING OUTSIDE BRUSH FOR BOTTLE WASHING MACHINES

Application filed February 9, 1925. Serial No. 7,862.

This invention relates to bottle-washing machines, particularly such as shown in Letters Patent 1,429,960, issued to George J. Meyer, September 26, 1922, wherein bottles are lifted from an intermittently moving conveyer and, when so lifted, are carried between rotating brushes for brushing them on the outside.

An object of the invention is to effect the cleaning of bottles and the like by passing them between rotating brushes, the brushes being so mounted as to yield bodily to the pressure of the bottles against them so as to adapt themselves to the changes in the diameter of the bottle.

An object of the invention is to so mount and drive the rotating brushes as to render them more sensitive to the pressure of the bottles as the bottles pass between them so that they yield more readily and consequently the brush bristles are flexed to a lesser degree and so perform their cleaning operation more thoroughly and with less wear.

Another object of the invention is to associate with the outside brushing mechanism a means for lifting bottles so that their bottoms bear against the brush which is turning toward the approaching bottles and which will therefore not brush the dirt from the bottoms of the bottles onto the bottles that have received the outside brushing.

Another object of the invention is to so mount the brushes that they may be readily removed from the levers by means of which they are suspended so that they may be cleaned or replaced by fresh brushes without materially delaying the operation of the machine.

With the above and other objects in view the invention consists in the swinging outside brushes for bottle-washing machines as herein claimed and all equivalents.

Referring to the accompanying drawings, in which like characters of reference indicate the same parts in different views,

Fig. 1 is a side elevation of a portion of a bottle-washing machine showing the swinging outside brushes of the present invention;

Fig. 2 is a plan view of the outside brushing mechanism;

Fig. 3 is an end view of the brushing mechanism as seen from the other side of the machine;

Fig. 4 is a sectional view on the plane of line 4-4 of Fig. 3;

Fig. 5 is a sectional view through the outside brushing mechanism showing the bottle lifting mechanism holding one bottle between the brushes and holding another bottle with its bottom against one of the brushes,

Fig. 6 is a perspective view of one of the removable brush bearing bushings,

Fig. 7 is a detail view partly in section of one of the brush bearings, and

Fig. 8 is a detail view showing the bottle lifting mechanism.

In these drawings, 10 indicates the frame of a bottle-washing machine which may be such as that shown in the Meyer patent above mentioned, and 11 represents the rows of bottle holders of the intermittently moving bottle conveyer thereof by the intermittent movements of which the rows of bottles are successively brought into position to be operated upon by exterior washing mechanism, constituting this invention and to be described in detail, and by interior washing and rinsing mechanism represented by a portion 12 thereof. The bottles 13 travel through the machine from left to right as viewed in Fig. 1 and reach the part of the machine shown to receive an external cleaning preliminary to their internal cleaning.

As in the patent referred to there is provided a vertically reciprocating bottle-lifting mechanism consisting of rotating upright spindles 14 to enter the mouths of bottles in one row of bottle-holders and lift them between a pair of oppositely rotating brushes 15 while turning them and reciprocating them between the brushes to expose all parts of the outer surface of the bottles to the cleaning action of the brushes, while spray-pipes 16 supply water for the cleaning operation.

The method of mounting and driving the

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brushes 15, however, is a matter of special consideration in the present case. A brush-supporting frame consisting of arms 17 mounted on a shaft 18 is pivotally supported in the main frame by said shaft fitting in bearings 19 and is counter-balanced by weights 20 mounted on the rearwardly bent extension at one end of said shaft. On the other end of the shaft is a driving pulley 21 for driving the brushes. Upon the horizontally extending arms 17 is a housing 22 covering the brushes and confining the water spray, and this housing is adjustable on the arms to position the brushes with respect to the bottle-lifting mechanism by clamping means 23 at the rear end of the housing, and by set-screws 24 in brackets 25 of the housing, through which the arms pass. Jack-screws 26 threaded through said brackets and passing through slots of the arms, bear on stationary supports 27 to adjustably determine the normal elevation of the brushes, though the brushes may be readily lifted because of their supporting frame being pivotally mounted and counter-balanced.

Mounted to oscillate in bearings at the ends of the housing are a pair of spray-tubes 16 which are provided with hose connections 28, through which water is supplied for the forcible sprays directed against the bottles, as shown in Fig. 5. Fixed on these spray-tubes at both ends of the housing are the brush-hangers 29 in the form of bell-crank levers having the brushes 15 journaled in their longer arms and having intermeshing gear segments 30 on their shorter arms so that the brushes move in unison toward or away from the central plane between them in which the bottle-lifting mechanism operates.

Loosely mounted on the ends of the water tubes 16 are brush-driving sleeves 31, each having a sprocket and chain connection 32 with the brush 15 therebeneath. The sleeves are geared together by intermeshing gears 33 thereon so as to turn the brushes at the same speed but in opposite directions, as indicated by the arrows, and receive their drive from the drive pulley 21 by one of them having a chain and sprocket connection 34 therewith.

It will be noted that although the weight of the brushes tends to cause them to swing toward each other, this tendency is opposed by the direction of the drive thereon for the influence of the drive is to cause the brushes to spread farther apart and consequently the brushes are sensitive to the pressure of the bottles as the latter are forced between them and yield readily without requiring the brush bristles to bend to any considerable extent, with the result that said brush bristles are more effective in their action. Incidentally this sensitive

suspension of the brushes which permits them to adapt themselves to the contour of the bottle materially increases the life of the brushes over brushes mounted in fixed bearings.

In order that the brushes may be quickly removed and replaced they are journaled in removable bearing bushings 35, shown in Fig. 6, such bushings being provided with opposite key projections 36 fitting in key grooves in the ends of the levers 29 and, when in place, being held by a set-screw or the like. As shown the set-screw takes the form of a grease-cup 38 with its stem engaging an opening 37 to continue the passageway of the grease-cup to the bore of the bearing bushing, so that the bearing may be lubricated. By loosening the grease-cups the bushings 35 may be withdrawn from the openings in the ends of the levers 29 in which they fit, thus exposing slots 39 in said ends of the levers which are of sufficient width to permit the brush trunnions to pass therethrough so that when the bushings are withdrawn the brushes are free to be removed through said slots.

It is found desirable to mount the brushes 15 above the level of travel of the bottoms of the bottles on the conveyer so that the right-hand brush, as shown in Fig. 1, will not throw dirt which may be carried by it onto the bottles that have received an outside cleaning. Instead it is desirable to slightly lift the bottles of the row following the row being lifted between the brushes to have their bottoms brushed by the left-hand brush in Fig. 1, for such dirt as may be spattered by that brush will not fall upon bottles that have been cleaned.

The vertically reciprocating bottle lifting and rotating mechanism, as seen in Figs. 5 and 8, comprises the row of rotating upright spindles 14 mounted on and carried by a miter gear cross-head 40, which is vertically reciprocated on stationary guides 43 and is lifted by means of levers 44 having links 45 connected therewith and slip joint links 46 connected with wrist pins 47 on cams 48 carried by a drive shaft 49. The upper position of levers 44 is shown in full lines in Fig. 8 and the lower position thereof is shown in dotted lines. The spindles 14 are guided by passing through a stationary guide bar 50 and are driven by miter gears 51 on their lower ends, meshing with miter gears 52 on a shaft 53 carrier lengthwise in the miter gear cross-head 40, which shaft carries a sprocket on one end connected by a chain 54 driven from a sprocket wheel 55 on a drive shaft 56.

To accomplish the lifting of bottles for the bottom cleaning the miter-gear cross-head 40, which is raised periodically for lifting a row of bottles between the brushes, has mounted on it clamp members 41 carry-

ing upstanding pins 42 in position to enter the bottles of the said row and these pins are of such length that they engage the bottoms of the bottles and lift them so that they bear against the brush, as shown in Fig. 5. Inasmuch as the bottles are lifted by their bottoms instead of by their necks, no adjustment is required when smaller bottles are used.

From the foregoing it will be seen that the improvements constituting the present invention make for a more thorough cleaning of the outside of the bottles with less wear on the brushes, while permitting the brushes to be replaced when necessary by a simple and quickly performed change that will not materially delay the operation of the machine. Also that the bottles will receive a bottom cleaning by mechanism that will not foul the cleaned bottles and that does not require adjustment when a change is made to bottles of a different size.

What we claim as new and desire to secure by Letters Patent is:

1. In a bottle-washing machine having a bottle conveyer, a reciprocating bottle-lifter for engaging the bottles and lifting them out of the conveyer, a pair of rotating brushes between which the bottles are moved by the bottle-lifter, and means for yieldingly supporting the brushes to permit them to yield to the pressure of the bottles thereagainst.

2. In a bottle-washing machine having a bottle conveyer, bottle-lifting means for engaging and lifting the bottles from the conveyer, rotating brushes between which the bottles are moved by the bottle-lifting means, and swinging supports for the brushes permitting them to yield to the pressure of the bottles thereagainst.

3. In a bottle-washing machine having a bottle conveyer, bottle-lifting means for lifting the bottles from the conveyer, rotating brushes between which the bottles are moved by the bottle-lifting means, yielding means for supporting the brushes, and driving means for the brushes tending to cause them to separate so as to more readily yield to the pressure of the bottles against them.

4. In bottle-washing machines, a pair of rotating brushes, means for moving the bottle between the brushes, and yielding means supporting the brushes permitting them to yield so as to be displaced by the passage of the bottle therebetween.

5. In a bottle-washing machine or the like, a pair of rotating brushes mounted for relative movement, means for forcing bottles between the brushes, and driving means for the brushes tending to separate them to make them more sensitive to the pressure of the bottles against them.

6. In a bottle-washing machine having a bottle conveyer, a bottle-lifting means for

lifting bottles from the conveyer, a pair of brushes between which the bottles are moved by the bottle-lifting means, swinging supports for the brushes, and means connecting the swinging supports for causing the brushes to swing in opposite directions when the bottles are forced between them.

7. In a bottle-washing machine having a bottle conveyer, a bottle-lifting means for lifting bottles from the conveyer, rotating brushes between which the bottles are forced by the bottle-lifting means, levers by means of which the brushes are suspended, said levers being connected together to move in opposite directions, and driving means for the brushes tending to cause them to separate to render them sensitive to the pressure of the bottles against them.

8. In a bottle-washing machine, a bottle conveyer, lifting means for lifting bottles from the conveyer, rotating brushes between which the bottles are forced by the lifting means, a pair of suitably mounted spray-tubes for spraying water on the bottles, bell-crank levers fixed on the spray-tubes and having segmental rack connection with each other and forming suspending means for the brushes, driving sleeves loosely mounted on the spray-tubes and geared together and having chain drive connection with the brushes.

9. In a bottle-washing machine having a bottle conveyer, lifting means for lifting the bottles from the conveyer, a pair of brushes between which the bottles are forced by the lifting means, swinging arms forming suspending means for said brushes, bushings slidably mounted in the ends of said arms and having the brush shafts journaled therein, there being slots at the ends of the arms through which the brush shafts are free to pass when the bushings are removed.

10. In a bottle-washing machine having a bottle conveyer, bottle-lifting means for lifting bottles from the conveyer, rotating brushes between which the bottles are moved by the bottle-lifting means, and means carried by the bottle-lifting means for entering the bottles next to the lifted bottles and lifting them so that their bottoms bear against one of the brushes.

11. In a bottle-washing machine having a bottle conveyer, bottle-lifting means for lifting bottles from the conveyer, rotating brushes between which the bottles are moved by the bottle-lifting means, and pins carried by the bottle-lifting means entering the bottles next to the lifted bottles and engaging the bottoms of the bottles for moving the bottoms of the bottles against one of the brushes.

12. In a bottle-washing machine having a bottle conveyer, bottle-lifting means for lifting bottles from the conveyer, a pair of rotating brushes with their adjacent surfaces

moving downwardly adapted to have the bottles forced between them by the bottle-lifting means, and pins on the bottle-lifting means for entering the bottles following the
5 lifted bottles to move their bottoms against one of the brushes.

13. In a bottle-washing machine having a bottle conveyer, bottle-lifting means for lifting the bottles from the conveyer, a pair of
10 brushes between which the bottles are moved by the bottle-lifting means, a housing within which the brushes are mounted, and a counter-balanced vertically swinging frame carrying the housing.

15 14. In a bottle-washing machine having a bottle conveyer, bottle-lifting means for lifting bottles from the conveyer, a pair of rotating brushes between which bottles are moved by the bottle-lifting means, a housing
20 within which the brushes are mounted, and a vertically swinging counter-balanced frame on which the housing is adjustably mounted.

15. In a bottle washing machine having
25 a bottle conveyer for conducting bottles in an inverted position, a brush beneath which the bottles pass, and means for lifting the bottles when they are beneath the brush to receive a bottom brushing.

30 16. In a bottle washing machine having a bottle conveyer for conducting bottles in an inverted position, a brush beneath which the bottles pass, and bottle-lifting means entering the bottles and engaging the bottoms
35 thereof for lifting the bottles into engagement with the brush.

17. In a bottle washing machine, the combination of a pair of rotatable brushes adapted to receive a relatively movable bottle therebetween, and yielding means supporting the brushes for permitting their variable separation in accordance with the breadth of the bottle passing therebetween.

In testimony whereof, we affix our signatures.
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OTTO DREHER.
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