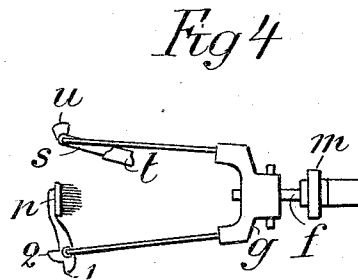
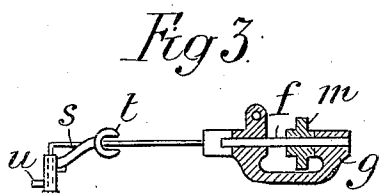
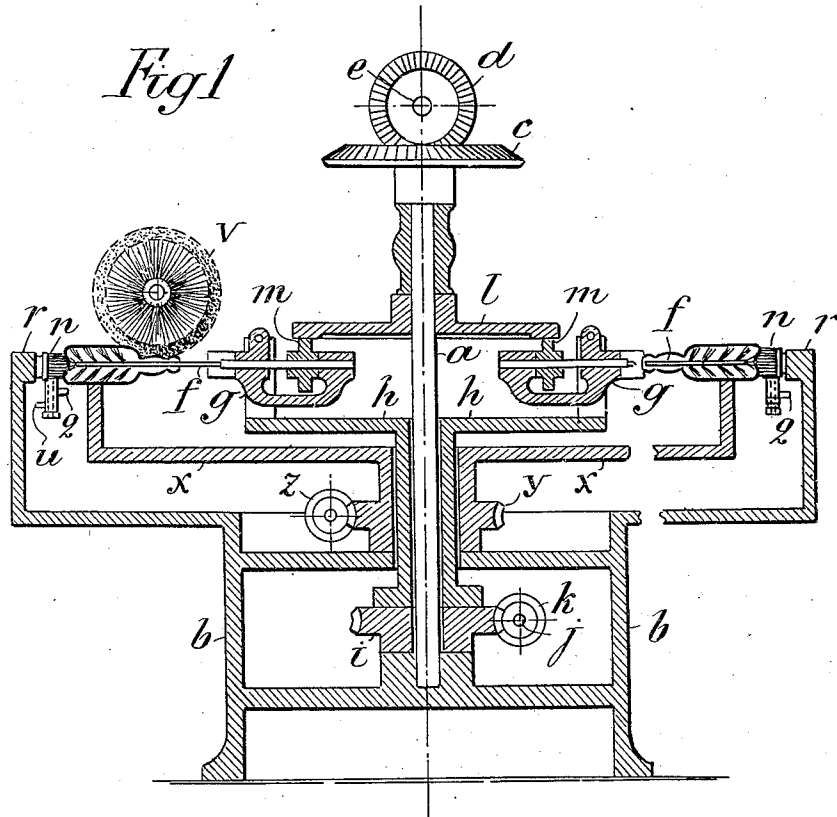


A. A. PINDSTOFTE.  
BOTTLE CLEANING MACHINE.  
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944,986.

Patented Dec. 28, 1909.

2 SHEETS—SHEET 1.



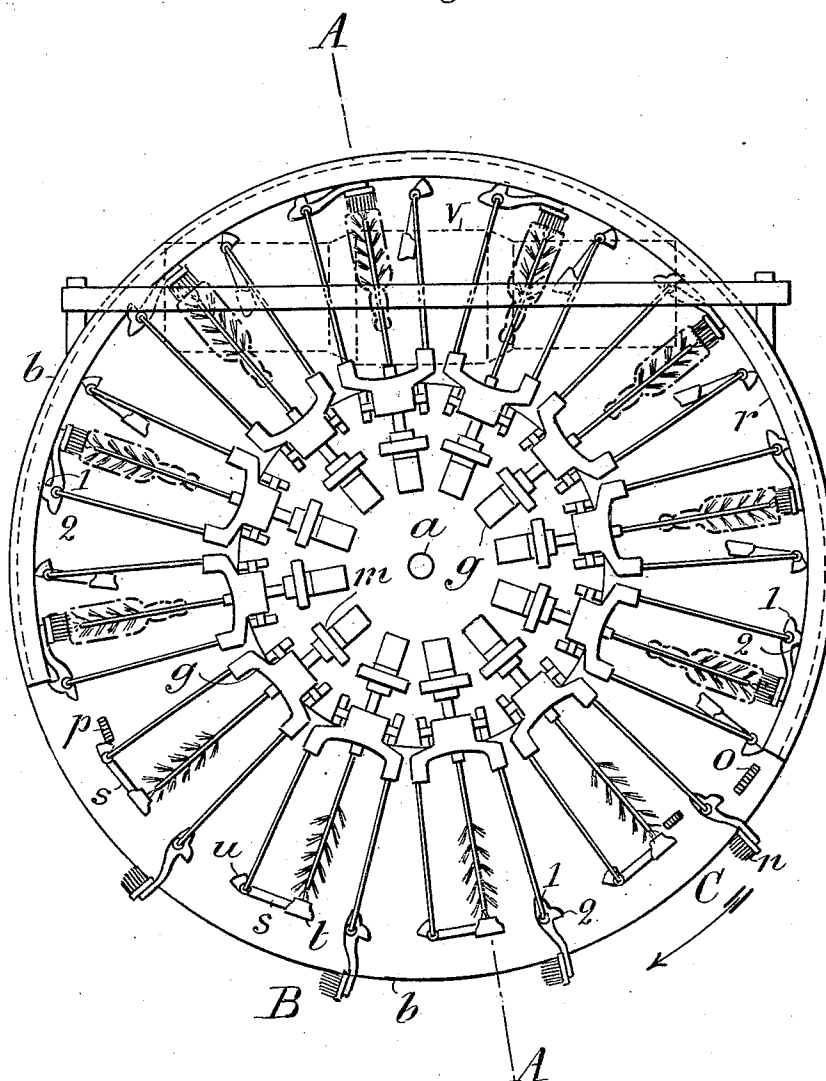
Witnesses  
*H. H. Knight*  
Ray J. Ernst.

Inventor  
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by *Thos. & Wm. H. H. Knight*  
his attorneys

944,986.

2 SHEETS—SHEET 2.

*Fig 2*



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# UNITED STATES PATENT OFFICE.

ANDERS ANDERSEN PINDSTOFTE, OF FREDERIKSBURG, NEAR COPENHAGEN,  
DENMARK.

## BOTTLE-CLEANING MACHINE.

944,986.

Specification of Letters Patent.

Patented Dec. 28, 1909.

Application filed April 9, 1909. Serial No. 488,943.

*To all whom it may concern:*

Be it known that I, ANDERS ANDERSEN PINDSTOFTE, manufacturer, a subject of Denmark, residing at No. 62 Frederiksberg, in the city of Frederiksberg, near Copenhagen, and Kingdom of Denmark, have invented new and useful Improvements in Bottle-Cleaning Machines, of which the following is a specification.

10 The invention relates to a continuously working rotary bottle cleaning machine, which simultaneously scrubs and cleans the inserted bottles both on the inner and the outer side.

15 The machine works with great rapidity and only one attendant is needed, who with one hand inserts the bottles to be cleaned and with the other hand takes off the cleaned bottles.

20 The machine is characterized by a number of horizontal brush-spindles which clean the inner side of the bottles and which are radially arranged around a rotary vertical shaft from which the brush-spindles are rotated, further by means by which all the brush-spindles are moved around said vertical shaft in such a manner that the bottles can be inserted upon and taken off from the brush-spindles at the same place. Further  
25 the machine is characterized by means by which said movement of the brush-spindles around the vertical shaft is automatically stopped if bottles are not inserted upon the brush-spindles, and further by a number of  
30 bottom-brushes, one for each of the brush-spindles, which are automatically pressed against the bottom of the bottle, when the cleaning commences and again automatically thrown back when the bottle shall be  
35 taken off.

40 The machine is further characterized by the provision of one or more scrubbing devices arranged above the brush-spindles which scrubbing devices clean the outside  
45 and neck of the bottles, and which for instance can be one or more cylindrical brush-rollers placed in such a manner that the line of intersection between a vertical plane through their axis and a horizontal plane  
50 through the axis of the brush-spindles will be a chord to the circle described by the ends of said brush-spindles, as by such an arrangement the entire exterior surface of

the bottles is treated in a very efficient manner. The effect is further increased if the diameter of the middle part of said brush-roller is greater than the diameter of its two ends as thereby the scrubbing effect upon the neck of the bottles and upon the part connecting the neck and the body of the bottles is improved. Further, the machine is characterized thereby that each of the brush-spindles with its appurtenance is mounted in a special bearing loosely mounted in the rotary frame carrying all the brush-spindles, which arrangement permits that all of said brush-spindle systems can be removed and inserted independently of each other.

Other characteristic features of the machine will appear from the following description and from the drawings which illustrate a constructional form of a machine arranged in accordance with the invention.

Figure 1 is a vertical middle section of the machine taken on the line A—A Fig. 2. Fig. 2 is a plan of the machine; the driving members upon the upper part of the vertical shaft are omitted. Figs. 3 and 4 show one of the loose brush-spindle systems respectively in vertical middle section and in plan.

80 Around the vertical shaft *a*, the lower end of which is supported in the stationary frame *b* and which by means of the gearing *c*, *d* is rotated from the driving shaft *e*, is arranged a number of radial, horizontal brush-spindles *f* the bearings *g* of which are loosely and oscillatorily inserted in a rotary frame *h*, which rests loosely upon the toothed wheel *i* rotated by a worm *k* fixed to a constantly rotated shaft *j*. The friction caused by the pressure of the frame *h* upon the toothed wheel *i* normally causes that the frame *h* is rotated around the shaft *s* together with the wheel *i*. Upon the shaft *a* is further fixed a friction disk *l* against which the friction rollers *m* of the brush-spindles are pressed by the weight of the bottles inserted upon said brush-spindles, so that in such case the brush-spindles are rotated when the shaft *a* is rotated. When the bottles are removed from the brush-spindles no pressure will keep the rollers *m* in frictional contact with the friction disk *l* and consequently the rotation of the brush-spindles will cease until bottles again are inserted upon the brush-spindles. The fric-

tion-disk  $l$  can be replaced by a toothed wheel in which case the friction-rollers  $m$  are replaced by pinions.

In front of each of the brush-spindles is arranged a revoluble bottom-brush  $n$  provided with studs 1 and 2. When the machine rotates in the direction of the arrow (Fig. 2) the stud 1 takes against a stud  $p$  fixed to the frame of the machine, thereby turning the bottom-brush against the bottom of the bottle inserted upon the corresponding brush-spindle whereupon said bottom-brush is kept in this position during the cleaning by the circular edge  $r$  of the stationary frame. When the cleaning is completed the stud 2 takes against a second stud  $o$  fixed to the frame  $b$ , thereby turning back the bottom brush so that the bottle can be removed. In front of each brush-spindle is further arranged a revoluble arm  $s$  provided with a recessed guide-funnel  $t$ , which normally is situated in front of the end of the brush-spindle and which has for its object to guide the mouth of the bottles during the insertion upon the brush spindles. The arm  $s$  is further provided with a stud  $u$ , which takes against the fixed stud  $p$  and stops the movement around the shaft  $a$  of the frame  $h$  if the arm  $s$  is not previously turned back by hands or by insertion of a bottle upon the brush-spindle.

Above the brush-spindles is mounted a brush-roller  $v$ , which rotates around a horizontal shaft and being arranged in such a manner that the line of intersection between a vertical plane through its axis and a horizontal plane through the axis of the brush-spindles is a chord to the circle described by the ends of said brush-spindles. The diameter of the middle part of said brush-roller is greater than the diameter of its two ends.

The bottles are supported by and roll upon a bottle-support  $x$ , which can be rotated by means of the worm gear  $y, z$ ; the bottle-supporting edge of said bottle-support  $x$  can be adjustable and its upper surface can be corrugated.

The working of the machine is the following: The attendant, who is placed in front of the machine, inserts the bottles upon the brush-spindles, when they are in the position C (Fig. 2) and removes the cleaned bottles from the brush-spindles when they are in the position C. During the passage through the machine the inner side of the bottles is treated by the brush-spindles  $f$  and the outer side by the bottom-brushes  $n$  and the scrubbing-apparatus or brush-roller  $v$  which owing to its special position will thoroughly clean the out-side of the bottles from one end of the bottles to the other.

#### Claims:

1. In a rotary bottle cleaning machine, the combination of a number of horizontal brush-spindles which clean the inside of the

bottles and which are radially arranged around a rotary vertical shaft which rotates the brush-spindles, means whereby all these brush-spindles may be moved around said vertical shaft, a guide-funnel, a bottom-brush pivotally mounted in front of each of said brush-spindles, and one or more scrubbing devices arranged above the brush-spindles for cleaning the outsides of the bottles inserted upon the brush-spindles.

2. In a rotary bottle cleaning machine, the combination of a number of horizontal brush-spindles which clean the inside of the bottles and which are radially arranged around a rotary vertical shaft which rotates the brush-spindles, a scrubbing device arranged above the brush-spindles for cleaning the outside of the bottles, a frame carrying the brush-spindles and rotated around the vertical shaft by frictional connection with a member constantly rotated around said shaft, and means whereby the rotation of the frame is stopped by overcoming said friction if a bottle is not inserted upon the brush-spindle which is next to come under the scrubbing device.

3. In a rotary bottle cleaning machine, the combination of a number of horizontal brush-spindles which clean the inside of the bottles and which are radially arranged around a rotary vertical shaft which rotates the brush-spindles, a guide-funnel, a bottom-brush pivotally mounted in front of each of said brush-spindles, an oscillatory bearing for each of said brush-spindles with its guide-funnel and bottom-brush, which bearings are loosely mounted in a frame surrounding said vertical shaft and means whereby said frame may be rotated around the vertical shaft.

4. In a rotary bottle cleaning machine, the combination of a number of horizontal brush-spindles which clean the inside of the bottles and which are radially arranged around a rotary vertical shaft which rotates the brush-spindles, means whereby all these brush-spindles may be moved around said vertical shaft, and a cylindrical brush-roller arranged above the brush-spindles in such a position that the line of intersection between a vertical plane through its axis and a horizontal plane through the axis of the brush-spindles is a chord to the circle described by the ends of said brush-spindles.

5. In a rotary bottle cleaning machine, the combination of a stationary frame, a number of horizontal brush-spindles which clean the inside of the bottles and which are radially arranged around a rotary vertical shaft mounted in said stationary frame and rotating the brush-spindles, a movable frame carrying the brush-spindles, means for rotating said movable frame, an arm pivotally mounted in front of each of the brush-spindles, a stud on said arm, and a stud secured

to the stationary frame and co-acting with the stud on the arm in such a manner that the rotation of the movable frame is stopped if the arm is not turned back manually or by inserting a bottle upon the brush-spindle.

6. In a rotary bottle cleaning machine, the combination of a stationary frame, a number of horizontal brush-spindles which clean the inside of the bottles and which are radially arranged around a rotary vertical shaft mounted in said stationary frame and rotating the brush-spindles, means whereby all these brush-spindles may be moved around said vertical shaft, a bottom-brush pivotally mounted in front of each of said brush-spindles, studs upon the pivots of said bottom-brushes, and studs secured to the stationary frame and coacting with said first named studs in such a manner that the bottom-brushes are moved against the bottom of the bottles when the cleaning is to commence and are returned to their initial position when the bottles are to be removed after cleaning.

7. In a rotary bottle cleaning machine, the combination of a number of horizontal brush-spindles which clean the inside of the bottles and which are radially arranged and oscillatorily mounted around a rotary vertical shaft, a friction disk fixed to said shaft, and a friction roller fixed to each of the brush-spindles and pressed against said friction disk when a bottle is inserted upon the brush-spindle thereby causing the brush-spindle to rotate.

8. In a rotary bottle cleaning machine, the combination of a number of horizontal brush-spindles which clean the inside of the bottles and which are radially arranged around a rotary vertical shaft which rotates the brush-spindles, means whereby all these brush-spindles may be moved around said shaft, and a rotary cylindrical brush having the diameter of its middle portion greater than the diameter of its two ends, which brush is arranged above the brush-spindles in such a position that the line of intersection between a vertical plane through its axis and a horizontal

plane through the axis of the brush-spindles is a chord to the circle described by the ends of said brush-spindles.

9. In a rotary bottle cleaning machine, the combination of a number of horizontal brush-spindles which clean the inside of the bottles and which are radially arranged around a rotary vertical shaft which rotates the brush-spindles, means whereby all these brush-spindles may be moved around said shaft, and a bottle-supporting edge supporting the bottles during the rotation and being adjustable to the diameter and length of the bottles.

10. In a rotary bottle cleaning machine, the combination of a number of horizontal brush-spindles which clean the inside of the bottles and which are radially arranged around a rotary vertical shaft which rotates the brush-spindles, means whereby all these brush-spindles may be moved around said shaft, and a bottle supporting edge supporting the bottles during the rotation and having its upper surface in variable distance below the brush-spindles thereby causing that the position of the bottles with respect to the brush-spindles is varied so that said brush-spindles alternately treat the upper and the lower part of the inside of the bottles.

11. In a rotary bottle cleaning machine, the combination of a number of horizontal brush-spindles which clean the inside of the bottles and which are radially arranged around a rotary vertical shaft which rotates the brush-spindles, and a guide-funnel pivotally mounted in front of each of the brush-spindles and being divided or recessed in such a manner that it is turned free of the brush-spindle when a bottle is inserted upon said brush-spindle.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ANDERS ANDERSEN PINDSTOFTE.

Witnesses:

VICTOR JUHLER,  
MARCUS MÖLLER.