Feb. 10, 1970 N. G. BARFRED 3,494,254

CANDLE MILLING MACHINE

Filed Nov. 7, 1967 2 Sheets-Sheet 1

Fig. 1.

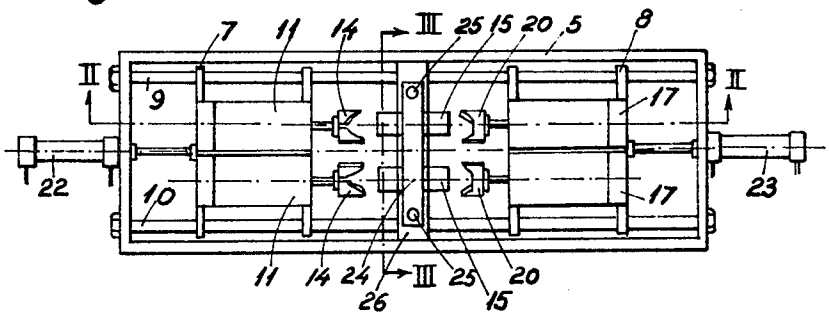


Fig. 2.

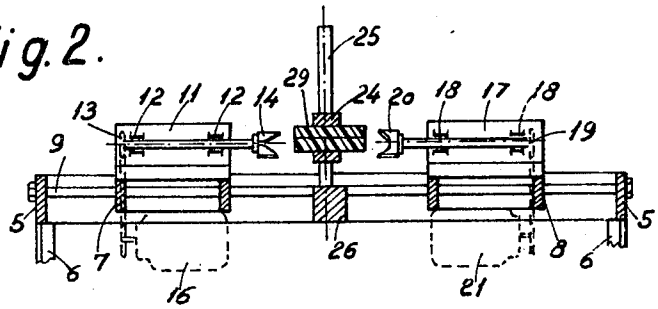
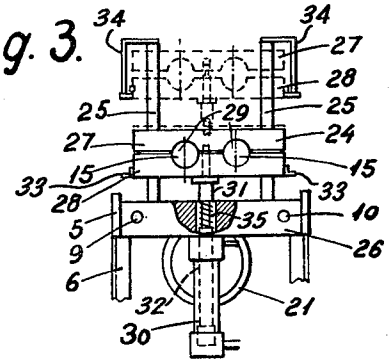


Fig. 3.



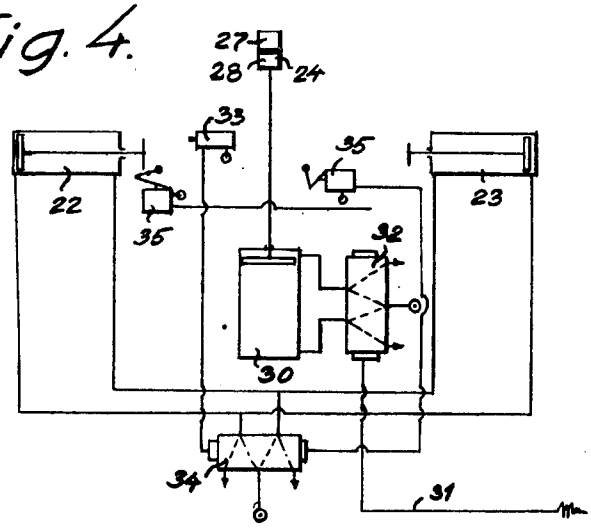
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Fig. 4.



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CANDLE MILLING MACHINE

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Int. Cl. B23c 1/00, 3/00, 7/00
U.S. Cl. 90—14 3 Claims

ABSTRACT OF THE DISCLOSURE

The invention relates to a machine for milling the ends of candle blanks, which comprises one or more sets of milling cutters, each set consisting of two cutters; means for moving said cutters towards and from one another; a holder for clamping one or more candle blanks, said holder being adapted to move the candle blanks into and away from the milling position; and means for synchronizing the various movements of said movable parts in response to an impulse from a candle blank supply mechanism.

This invention relates to a machine for milling the ends of candle blanks.

In the modern development of the candle making industry, the old art of casting the candles individually in moulds is gradually being abandoned in favour of an extrusion process, in which the candle bodies are extruded as a continuous rod around the wick, the said rod being subsequently cut in appropriate lengths, the ends of which are then milled to make a proper candle form.

It is an object of the present invention to provide a machine, in which this milling of the ends of the candle body blank enclosing a wick can be performed automatically at high speed without any manual operation, once the machine has been adjusted to a particular length of candle, all operations being controlled and guided by the supply of the candle blanks to the machine.

Accordingly, the machine of the invention comprises at least one pair of milling cutters being movable towards and from one another for simultaneous milling of both ends of a candle body to the desired form, and in between said cutters a candle body holder being adapted to move into and away from the path of movement of said cutters to hold the candle bodies in the former position during the milling, and to receive further candle bodies with ejection of the milled ones in the latter position, the said holder comprising jaws and means for opening the jaws in the receiving position and clamping them around the candle body prior to the milling, the movable parts of the machine being adapted to perform their individual movements in synchronization on an impulse starting the sequence of movements. Such impulse may, for example, originate from the candle body supply mechanism.

In a preferred embodiment, the machine has two pairs of milling cutters and, preferably, the two cutters milling each end of a candle body blank rotate in opposite directions in relation to said blank.

For a better understanding of the invention in its various aspects, a more detailed description will be given in the following with reference to the accompanying drawings, in which

FIG. 1 is a schematical plan view of an embodiment of a candle milling machine according to the invention,

FIG. 2 is a longitudinal section on line II—II of FIG. 1,

FIG. 3 is a cross-section on line III—III of FIG. 1, and

FIG. 4 is a diagrammatic view, showing the connections between driving members of the machine, and means for activating said members.

The machine has a rectangular frame 5 resting on legs 6. Within the frame 5, two slides 7 and 8 are mounted on longitudinal guide rods 9 and 10.

The slide 7 carries housings 11 enclosing bearings 12 and driving members 13 for milling cutters 14 for milling the burning ends of candle body blanks 15, and an electromotor 16 for driving the cutters 14.

Similarly, the slide 8 carries housings 17 enclosing bearings 18 and driving members 19 for milling cutters 20 for milling the opposite ends of the candle body blanks 15 to fit in a candlestick socket, and an electromotor 21 for driving the cutters 20. The two cutters 14 and 20 of each pair preferably have opposite directions of rotation.

The slides 7 and 8 are operated by double-acting pneumatic or hydraulic cylinders 22 and 23, respectively, means being provided for adjusting the movement of the slides 7 and 8 in accordance with the length of the candle body blanks to be milled.

Between the two sets of milling cutters 14 and 20, respectively, a holder 24 for the candle body blanks is provided. The holder 24 is movable up and down on two vertical guide rods 25, which are mounted on a transverse brace 26 in the frame 5.

The holder 24 is in two parts 27 and 28 fitting together to form two bores 29 of cylindrical or other cross-sectional shape to hold the candle body blanks 15.

A pneumatic or hydraulic double-acting cylinder 30 is provided for moving the holder 24 up and down on the guide rods 25, suitable means (not shown) being provided to open the holder at its top position (as shown with dotted lines in FIG. 3) for easy insertion of the candle body blanks, and to close it around the blanks in its downward movement.

One way of opening the holder could be to fit a spring-loaded sleeve 31 on the piston rod 32 of the cylinder 30 to bear against part 28 of the holder being movable on the piston rod, to the end of which part 27 of the holder is fixed. At a suitable stage of the upward movement, part 28 could then be stopped by ears 33 fixedly secured to the part 28 striking the stationary arms 34 secured to the upper ends, respectively, of the guide rods 25, a compression of the spring 35 allowing a slight further movement of part 27 and an expansion of said spring moving said part 28 relative to part 27 for holding candle body blanks between them upon downward movement of the holder.

The machine functions in the following manner: In the starting position, cf. FIG. 4, the holder 24 is in top position with its parts 27 and 28 slightly apart. Two candle body blanks carried forward by a cutting device, working in continuation of an extruder for simultaneous extrusion of two rods of candle body material, are inserted in the holder 24. As soon as said blanks are inserted in the holder, the return movement of said cutting device relieves an impulse, for example pressurized air through a pipe 31 to a change-over valve 32, causing the pneumatic cylinder 30 to pull the holder 24 down to a suitable position on line with the milling cutters 14 and 20, at the same time moving the parts 27 and 28 of the holder 24 together to securely grip the candle body blanks. On arriving to the working position, the holder 24 contacts a switch member 33 whereby a change-over valve 34 is caused to supply pressurized air to the bottom ends of the pneumatic cylinders 22 and 23 to bring these cylinders into action to move the slides 7 and 8 forward in order that the milling cutters 14 and 20 may simultaneously engage the ends of the candle body blank to be milled. The electromotors 16 and 21 for driving the milling cutters 14 and 20 are preferably started before and running continuously.

When the slides 7 and 8 have moved sufficiently for-

ward to finish the milling, they encounter microswitches **35**, which cause the pressure fluid supply to the cylinders **22** and **23** to be reversed, so as to withdraw the slides **7** and **8**. During, and caused by this withdrawal of the slides, the pressure fluid supply to the cylinder **30** is reversed, to make the latter push the holder **24** to its top position, where the parts **27** and **28** are slightly separated. Then newly arriving candle body blanks push out and replace the milled ones, and the whole operation is repeated.

I claim:

1. A machine for milling the ends of a candle body comprising at least one pair of milling cutters that are movable toward and away from each other for simultaneous milling of both ends of a candle body to desired form when being moved toward each other, means for effecting movement of said milling cutters toward and away from each other, means for rotating said milling cutters for milling the ends of said candle body, a candle body holder which is disposed between said cutters and which comprises oppositely disposed jaws adapted to hold a candle body between them, means for moving said candle body holder between a first position to hold a candle body substantially in alignment with the path of movement of said cutters and a second position away from the path of movement of said cutters, means for opening said jaws when said holder is moved away from the path of movement of said cutters to permit insertion of a candle body between them, and means for closing said jaws to hold said candle body between them when said holder is moved into said first position.

2. A machine according to claim **1** which comprises means for effecting in automatic sequence the movement of said holder from said second position to said first position the closing of said jaws about said candle body when said holder is moved into said first position, the movement of said cutters toward and then away from the ends of the candle body held by said holder, the return movement of said holder to said second position, and the opening of said jaws of said holder when said holder is moved into said second position.

3. A machine according to claim **1** which comprises two pairs of milling cutters, and means for rotating the cutters of each pair in opposite directions.

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U.S. Cl. X.R.

82—2; 90—11; 144—30

PO-1050
(5/69)

UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,494,254 Dated 8/25/70

Inventor(s) Niels G. Barfred

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Claim 3, line 2, after "the" the word --opposed-- should be inserted.

SIGNED AND
SEALED
OCT 13 1970

(SEAL)
Attest:

Edward M. Fletcher, Jr.
Attesting Officer

WILLIAM E. SCHUYLER, JR.
Commissioner of Patents