

Dec. 19, 1961

F. POCOCK

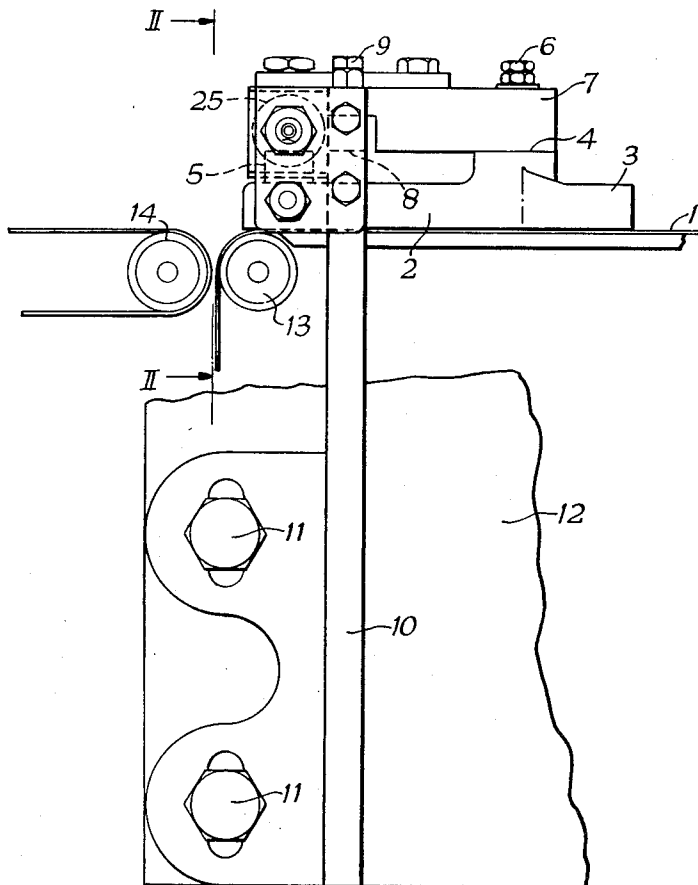
3,013,659

MANUFACTURE OF STUBS FOR MOUTHPIECE CIGARETTES

Filed June 17, 1958

3 Sheets-Sheet 1

Fig. 1.



INVENTOR

Frederick Pocock

BY

Watson, Cole Brendle & Watson

ATTORNEYS

Dec. 19, 1961

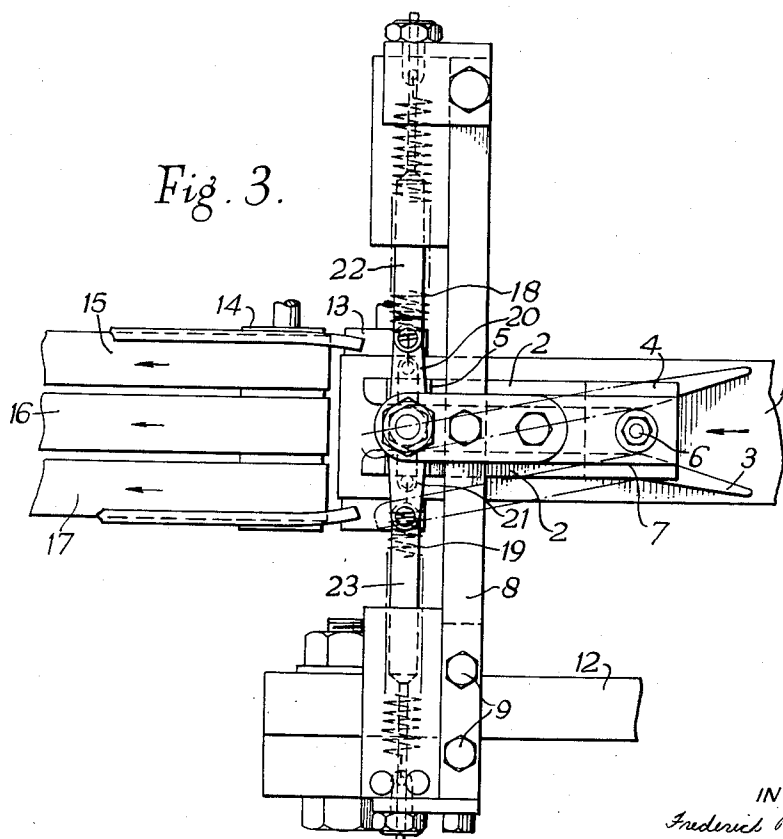
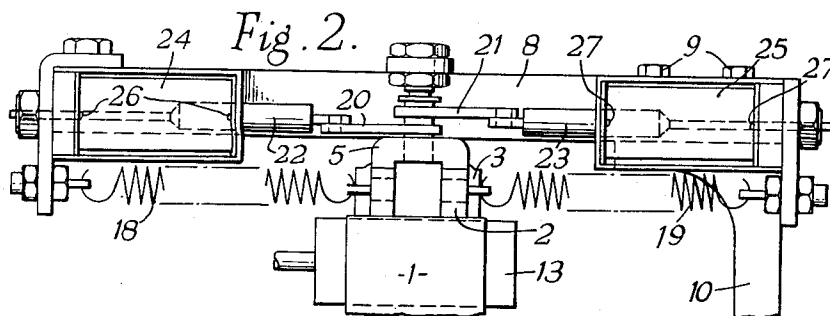
F. POCOCK

3,013,659

MANUFACTURE OF STUBS FOR MOUTHPIECE CIGARETTES

Filed June 17, 1958

3 Sheets-Sheet 2



INVENTOR

Frederick Pocock

BY

Watson, Cole, Grindley & Watson

ATTORNEYS

Dec. 19, 1961

F. POOCK

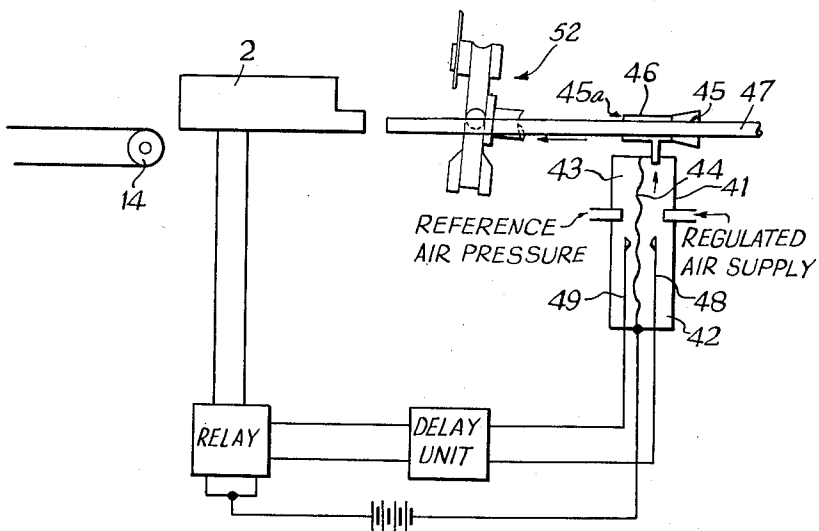
3,013,659

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Filed June 17, 1958

3 Sheets-Sheet 3

Fig.4.



INVENTOR

Frederick Pocock

BY

Watson, Ck, Brundell & Watson

ATTORNEYS

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3,013,659

MANUFACTURE OF STUBS FOR MOUTHPIECE CIGARETTES

Frederick Pocock, London, England, assignor to Molins Machine Company Limited, London, England, a British company

Filed June 17, 1958, Ser. No. 742,616

Claims priority, application Great Britain June 28, 1957
3 Claims. (Cl. 209—82)

This invention concerns improvements in or relating to the manufacture of stubs for mouthpiece cigarettes—for example, stubs made of filtering material.

Stubs for mouthpiece cigarettes are often made by forming a continuous rod of stub material and cutting the rod into suitable lengths. It is found that the cross-sectional size of such a rod sometimes varies along its length, with the result that the stubs vary in cross-sectional size. It is important that a composite mouthpiece cigarette should consist of a cigarette length and a stub of substantially identical diameter. This is necessary in order to make it possible to unite a stub and a cigarette length, for example, by a uniting band, without leaving gaps between the band and the stub or cigarette length, through which gaps air might be able to flow. Accordingly stubs are sometimes graded as to diameter and sorted into different sizes for use with cigarette lengths of appropriate sizes.

According to the present invention there is provided, for use with a machine for making stubs by a continuous rod process, a grading or sorting device comprising a measuring device to measure the rod, and means responsive to said measuring device to grade the stubs according to their cross-sectional size. For example the last said means may comprise a movable guide for stubs, which guide is movable in response to the measuring device so as to guide stubs of different cross-sectional size into different paths.

Preferably the measuring device is one similar to the device described and illustrated in the United States Patent No. 2,952,262, granted September 13, 1960 to Pocock et al. which is co-pending, for measuring the cross-sectional size of a continuous cigarette rod. In that device, the rod is passed through a chamber into which air is introduced under pressure and from which the air escapes through apertures which are partially blocked by the rod, so that the air pressure in the chamber varies according to the rate at which the air can escape, and thus gives an indication of the cross-sectional size of the part of the rod which is passing through the chamber. Such variations in pressure cause movement of a diaphragm exposed to the air in the chamber, and these movements can be utilised to effect an electric circuit, whereby, in the present case, the means to grade the stubs may be energized. For example one or the other of a pair of solenoids may be energized to cause movement of a movable guide member for the stubs. The guide member may be pivotally mounted and arranged to guide the stubs lengthwise in one of three different paths—that is, it may occupy a central or neutral position, in which it guides the stubs in a certain path when their cross-sectional size (as detected by the measuring device) is within certain limits, and it may be swung by means of one solenoid or the other so as to deflect stubs into one of two further paths when the cross-sectional size of such stubs is found to be above or below the said limits.

A device in accordance with the invention will now be described by way of example with reference to the accompanying drawings in which:

FIGURE 1 is a side elevation of a grading or sorting device;

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FIGURE 2 is an end view taken on the line II, FIGURE 1;

FIGURE 3 is a plan, and

FIGURE 4 shows schematically an arrangement incorporating a measuring device and its connections with the grading device.

In the drawings a conveyor 1 represents the conveyor by which lengths of stub rod (for example sextuple lengths such as are commonly used) are carried lengthwise from the cut-off device of the stub-making machine. It is to be understood that the machine is equipped with a measuring device such as that disclosed in the co-pending United States patent aforementioned, and that this measuring device is positioned to measure the continuous rod before the latter reaches the cut-off.

The grading or sorting device comprises a pair of opposed guide walls 2, with flared extensions 3, and connected by bridges 4 and 5. It is pivoted at 6 by means of the bridge 4 on the underside of a block 7 secured to a bar 8, one end of which is secured by screws 9 to a bracket 10. The bracket 10 is fixed by bolts 11 to any convenient fixed part 12 of the machine. The guide member 2 can be swung on its pivot in either direction; in FIGURE 3 it is shown in dot-and-dash line in the position it occupies when swung in one direction.

The band 1 passes over a roller 13, just beyond the end of the guide member 2. Beyond the band 1 is a further roller 14 about which pass three endless conveyor bands 15, 16 and 17, FIGURE 3. When the guide member 2 is in its intermediate position parallel with the band 1, it registers with the central band 16. When it is swung to the position shown in dot-and-dash line, it registers with the conveyor band 17, and similarly if it is swung in the opposite direction it will register with the band 15.

Springs 18 and 19 fixed to the guide member 2 and to extensions of the bar 8 tend to keep the guide member centralised and to return it to its central position.

The guide member 2 is connected by links 20 and 21 to plungers 22 and 23 of a pair of solenoids 24 and 25 respectively. These solenoids are connected by wires 26 and 27 (FIGURE 2) to an electrical device by which one or other of the solenoids may be energised. As has been stated above, the grading device according to the present invention may be used with a measuring device such as that described in the co-pending United States patent aforementioned. In that device, variations in the air pressure in the measuring chamber due to variations in cross-sectional size of the continuous rod being measured (in the present case, a rod of stub material) cause movement of a diaphragm in one direction or the other. If the movement of the diaphragm in either direction is large enough, a contact element connected to the diaphragm will contact one of a pair of fixed contact elements positioned on either side of it. The three contact elements are connected by wires to the electrical device mentioned above, which is in turn connected by the wires 26 and 27 to the solenoids 24 and 25. The arrangement is such that contact between two of the three contact elements in the measuring device (indicating that the cross-sectional size of the rod momentarily passing through the measuring device is greater or lower than a predetermined range) establishes an electric circuit whereby one or other of the solenoids 24 and 25 is energised so that its plunger 22 or 23 pulls the guide member 2 about its pivot in one direction or the other.

It will be seen that as long as neither of the two solenoids is energized, stubs passing through the guide member 2 will be guided on to the central conveyor band 16. If it is swung anti-clockwise as viewed in FIGURE 3, to the position shown in dot-and-dash lines in that figure, the stubs will be guided on to the band 17, while if it is swung clockwise they will be guided on to the band 15.

Since the swinging of the guide member 2 is effected by the solenoids in response to the rod measuring operation, it will be seen that the stubs will be directed on to the conveyor bands 15, 16 and 17 according to the cross-sectional size of the rod as detected by the measuring device.

If desired, the electrical device could incorporate a delay unit of any suitable known kind whereby a solenoid would be energised only after a suitable delay such that the resulting deflection of stubs by the guide member affects only those stubs which formed that part of the rod whose measurement caused the actuation of the electrical device. On the other hand it may be unnecessary to incorporate such a delay unit, since in the manufacture of the stub rod, variations in cross-sectional size of the rod are often of a long-term nature, and direct energising of the solenoids is probably sufficiently accurate for the purpose of grading or sorting the stubs into sizes.

The stubs received on the three conveyor bands 15, 16 and 17 may be conveyed into separate receptacles so as to be available for use with cigarettes of appropriate sizes.

FIGURE 4 shows diagrammatically a suitable arrangement incorporating a measuring device as disclosed in FIGURES 5-8 of the aforementioned United States patent, the connections between this measuring device and the grading or sorting device described above being schematically. For simplicity the measuring device, generally indicated by the reference numeral 41, is shown as comprising two compartments 42 and 43 at opposite sides of a diaphragm 44, the compartment 42 communicating with orifices 45 and 45a of a tubular passage 46 through which a rod 47 of plug material continuously passes in the direction shown by the arrow. Air under suitable pressure is supplied to the compartments 42 and 43 respectively as shown. Two electrical contacts 48 and 49 are located at opposite sides of the diaphragm 44, which itself comprises a third contact. The contacts 43 and 49 are shown connected through a delay unit and a relay to the grading or sorting device. The plug rod 47 passes from the measuring device to a cut-off device 52 which serves it at suitable intervals, and the resulting plug lengths are carried by the conveyor 1 (which is not shown in FIGURE 4) through the guide member 2.

The details of construction and operation of the measuring device 41 are given in the specification referred to above and need not be given here.

What I claim as my invention and desire to secure by Letters Patent is:

1. For use with a stub making machine in which a continuous rod of stub material is formed and cut into stubs, a measuring and grading device comprising in combination a measuring chamber through which the continuous rod passes, and into which air is introduced under pressure, said chamber having an escape aperture for air which aperture is partly blocked by the continuous rod, whereby the air pressure in the chamber varies according to the cross-sectional size of the rod passing through said aperture, a movable member exposed to the air in the chamber and movable in response to variations in said air pressure, guide means for stubs cut from the continuous rod, and means responsive to movements of said movable member to actuate the said guide means to cause the latter to guide stubs of different cross-sectional size into different paths.

2. Apparatus as claimed in claim 1, wherein the said guide is movable from a neutral position which it occupies when the cross-sectional size of stubs is found to be within desired limits, to one of two other positions when the cross-sectional size of stubs is found to be above or below said limits.

3. Apparatus as claimed in claim 2, wherein the means responsive to the measuring device comprises at least one solenoid arranged to be energised in response to the measuring device so as to cause movement of the said guide.

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