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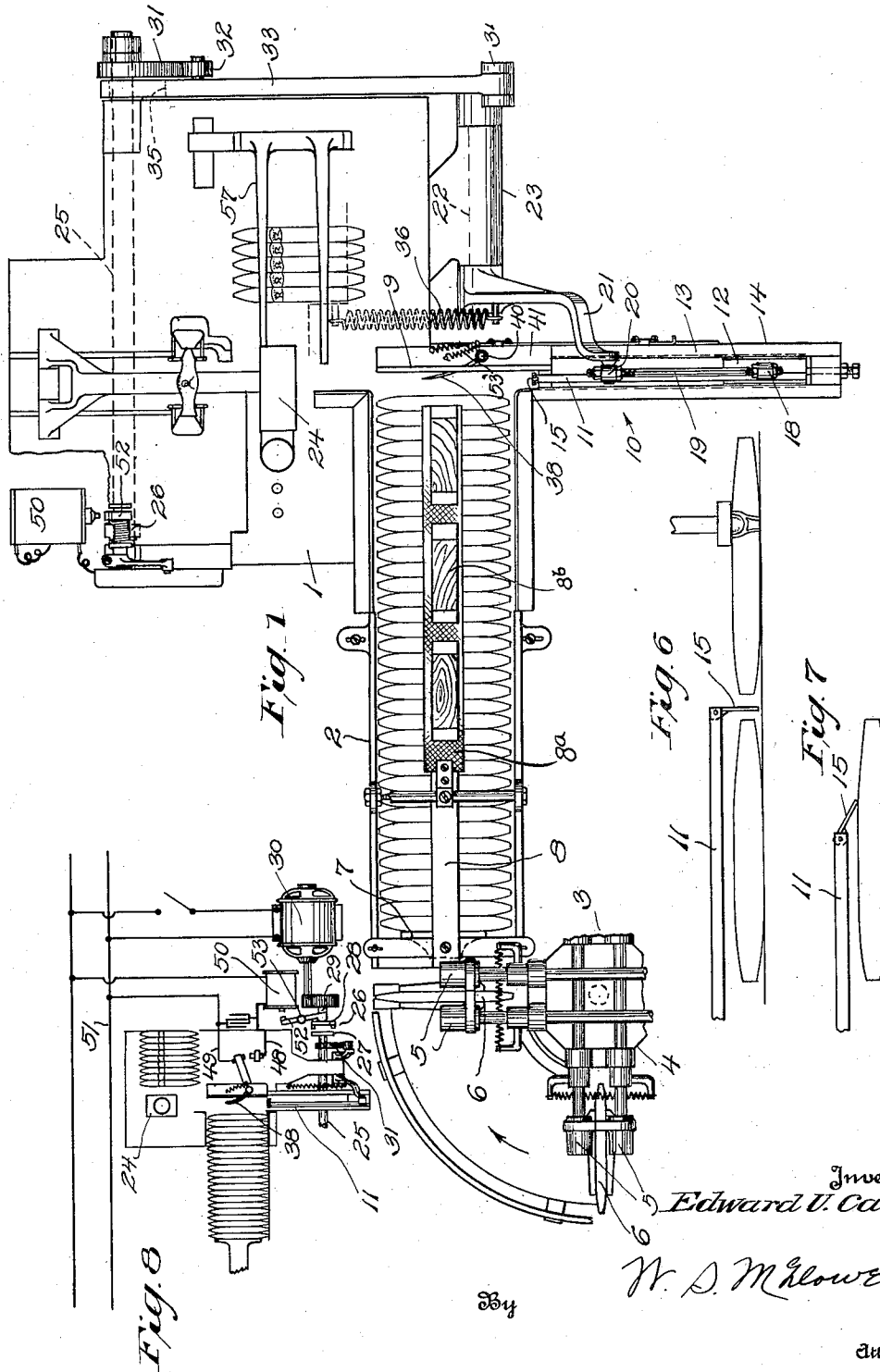
E. U. CAVE

2,011,536

FEEDING DEVICE

Filed April 26, 1930

2 Sheets-Sheet 1



Aug. 13, 1935.

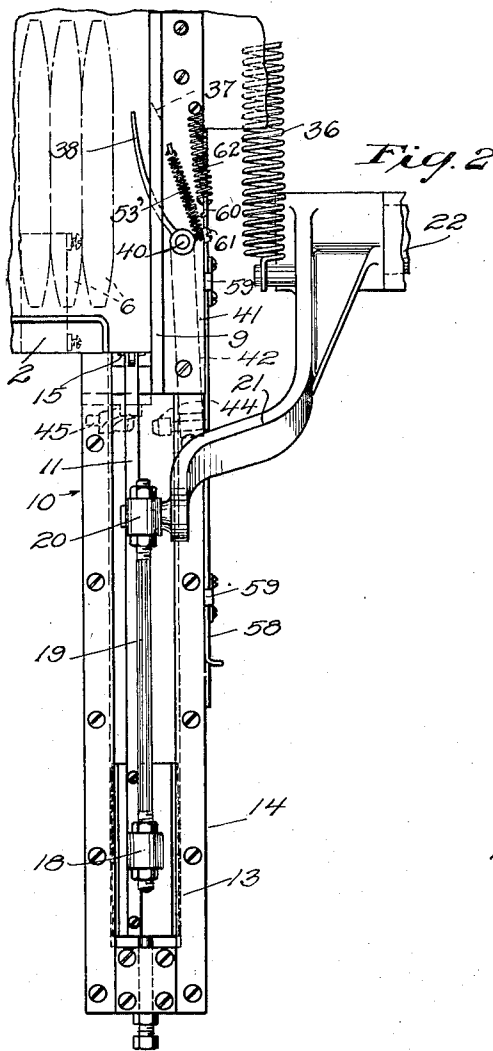
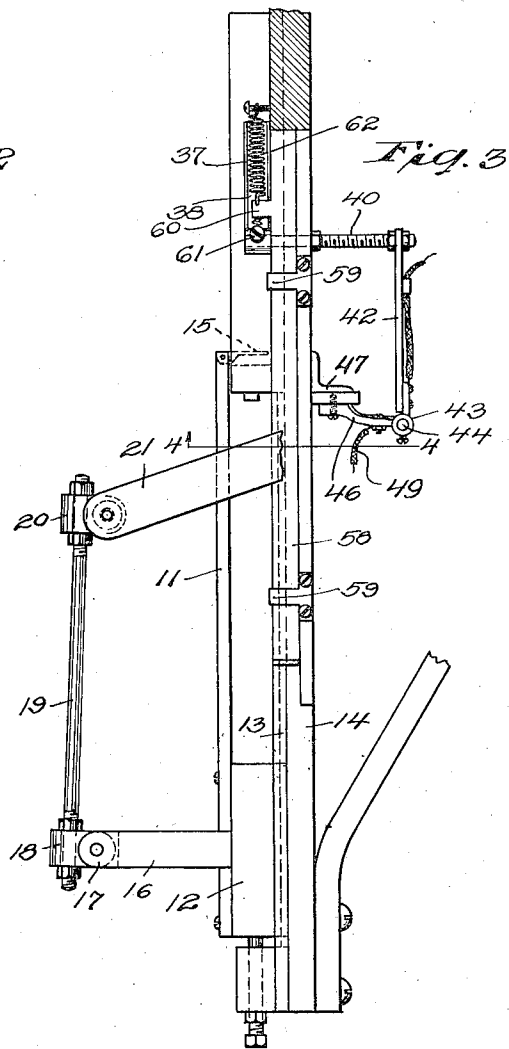
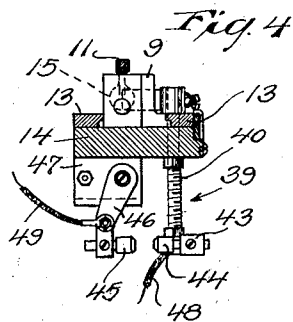
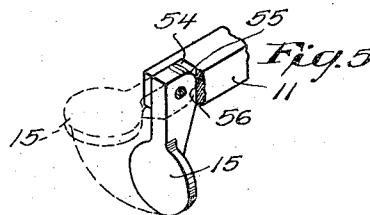
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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

2,011,536

FEEDING DEVICE

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7 Claims. (Cl. 198—21)

This invention relates to an automatic feeding device and is directed more particularly to cigar feeding means adapted for use in connection with a cigar banding machine to feed cigars to said machine for banding application.

Automatic feeding devices have been heretofore proposed for feeding cigars to the banding machine. However, such devices as far as I am aware, have been synchronized with a foiling machine, or in other words, both the foiling machine and the feeding device for the banding machine are operated by a common prime mover. The feeding device has also been connected or synchronized with means for moving a body of cigars towards said device. The objection to having the cigar feeding device for the banding machine operated or controlled for operation directly with the foiling machine or the means for moving the body of cigars is that said feeding device will operate regardless of the position of the cigars and that particular care must be taken to synchronize both apparatus so that the cigars to be fed into the banding machine will be in a proper position or alignment with the feeding device. This is rather difficult in that due to slight variations in the thicknesses of the cigars, irregularities thereof and other factors, the cigars to be fed into the banding machine may be to one side of the injecting plunger of the feeding device and not properly timed with the result that the cigar may be crushed by the plunger or not correctly positioned under the banding head.

The primary object of the present invention is to overcome these objections and to provide a feeding device which is controlled entirely by the cigars moved towards the feeding device of the banding machine, thereby insuring the correct positioning of the cigar before injecting the same by the feeding plunger into and under the banding head.

Another object of the invention resides in the provision of a feeding device and a banding machine which are synchronized in motion with each other and rely upon the flow of the cigars to regulate the successive delivery of said cigars to the banding machine.

It is also an object to combine the feeding device of the banding machine with a cigar foiling machine, wherein the cigars after being foiled are moved in a body side by side and horizontally over a table by the ejecting mechanism of the foiling machine. This arrangement is particularly desirable in that the body of the cigars thus forms a connecting element between the two machines and the cigars may thus be discharged from the

foiling machine at regular intervals or intermittently and fed to the feeding device of the banding machine in the same manner eliminating the necessity of having the feeding device of the banding machine in operation during the idling operation of the foiling machine.

A further object of the invention is to control the banding machine and the associated cigar feeding device therefor electrically by inserting a switch in the path of the moving body of cigars with which the cigar nearest the feeding device engages to close a circuit, whereby through the provision of an electromagnetic device, the feeding device will be operated, but by the absence of a cigar adjacent the switch the latter will move by spring action to an open circuit position.

It is also an object of the present invention to provide an automatic feeding device of this character which will obviate the necessity of an operator for feeding the cigars to the banding machine.

With these and other objects in view, which will appear as the description proceeds, the invention consists in the novel features of construction, combination of elements and arrangement of parts hereinafter to be more fully described and pointed out in the appended claims.

In the accompanying drawings:

Figure 1 is a plan view of a banding machine and the feeding device associately connected with a foiling machine of the latter of which only a small portion is shown.

Figure 2 is an enlarged detail view of the feeding device comprising the present invention.

Figure 3 is a side elevation thereof.

Figure 4 is a transverse vertical sectional view taken on the line 4—4 of Figure 3.

Figure 5 is a detail perspective view of the cigar engaging end of the feeding plunger forming a part of the feeding device.

Figure 6 is a side elevation of said plunger showing the same at the beginning of its retracting stroke after feeding the cigar to the head of the banding machine.

Figure 7 is a similar view illustrating to more advantage the movable cigar engaging end provided at the end of the plunger.

Figure 8 is a diagrammatic layout disclosing the arrangement of the various elements entering into the working of the invention.

Referring more particularly to the drawings the numeral 1 designates generally the banding machine, the numeral 2 the cigar carrying table and the numeral 3 the cigar foiling machine which in this instance forms the means for feeding or moving the cigars over the table 2.

The foiling machine, which is of common construction, includes a rotatable carrier 4 having spaced movable finger elements 5 mounted thereon between which the cigars 6 are held and acted upon by mechanisms (not shown) for applying the foils or wrappers to said cigars, the mechanism of the carrier 4 and the fingers 5 being such as to discharge or release the cigars at the end of the table nearest the carrier 4 and at which point other mechanism including a reciprocatory member 7 will push the body of cigars at regular intervals longitudinally of the table 2 in a direction towards the banding machine. This body of cigars may be moved, as stated before, at regular intervals or moved intermittently depending upon the discharge of the foiling machine. To keep the cigars in their proper relation while being moved over the table 2, there is provided a strip 8 which is arranged in close relation to the cigars thus preventing rotation and misalignment thereof. A flexible strip 8a may also be provided having blocks 8b thereon acting as weights for holding the cigars down and keeping the same in contact with each other during their travel over the table. A flange 9 is provided at the outlet end of the table and forms a stop with which the first cigar of the row engages.

The feeding device which comprises the present invention and is designated generally by the numeral 10 is located at the outlet end of the table 2 and includes a horizontally disposed plunger 11 having its rearward end attached to a block 12 reciprocating within a guide 13 formed within a bracket extension 14 arranged laterally and at right angles to the table 2. The forward end of the plunger 11 is formed with a hinged cigar-engaging piece 15 depending therefrom, the purpose of which will appear later. Arising from the block 12 is a post 16 having spaced ears 17 at its upper end forming a pivot support for a rocking block 18 to which one end of the rod 19 is threadedly connected. The other end of the rod 19 is attached to a similarly shaped block 20 mounted for swinging movement upon a pin carried by the upper end of a rocker arm 21 which is keyed or otherwise secured to a rock shaft 22 journaled for movement within a bearing 23 formed with the frame structure of the banding machine. It will thus be seen that upon rocking movement of the arm 21 and the related mechanism the plunger 11 will thus be caused to move into engagement with the cigar positioned in alignment with the plunger and push the cigar under the banding head 24 where the banding operation is performed.

The banding machine which is also of common construction includes an operating shaft 25 with which the mechanism (not shown) of the banding head is operably connected and with which the feeding plunger mechanism is also directly connected for simultaneous operation. The shaft 25 is provided with a clutch 26 of any suitable construction and which clutch includes a fixed member 27 carried by the end of the shaft 25 and a slidable clutch member 28 mounted upon the end of a short shaft section 29. The latter clutch member is driven through a suitable gearing by a motor 30 which during the use of the banding machine is constantly driven or in motion. Keyed or otherwise secured to the shaft 25 is a cam 31 with which is engaged a roller 32 mounted for rotation near one end of a bar 33. The other end of this bar is pivotally connected to an arm 34 attached for rocking movement with

the shaft 22 of the feeding device. A slot 35 is provided in the end of the bar 33 carrying the roller 32 and through which slot the shaft 25 extends, the slot permitting the bar 33 to slide upon the shaft 25 and to be moved in one direction by the action of the cam 31. To keep the roller 32 against the working face of the cam 31 there is provided a coil spring 36, which has one of its ends attached to the frame structure of the banding machine and the other end connected to the rocker arm 21. The spring acts in opposition to the cam 30 to move the plunger 11 in the other direction. The cam 31 may be of any suitable shape. It has been found, however, that a cam giving a harmonic action is the best suited for the purpose.

From the structure so far described, it will be noticed that the banding machine and the feeding device therefor is directly connected for simultaneous operation or driven from the same motor. Thus the banding machine may be timed or set to function at the proper moment with the operation of the feeding device.

Formed in the flange 9 and located in the central axis of the table 2 is a slot 37 through which extends a free end of a finger 38 of the switch mechanism 39. The finger 38 is mounted and attached for horizontal swinging movement on the upper end of a spindle shaft 40 having its bearing in the horizontal leg 41 of the flange 9 and in one end of the table 2. Threads are provided upon the lower portion of the spindle 40 for the connection and adjustment of an arm 42 carrying a socket 43 at its outer free end for the reception of an electric contact point 44. Co-operating with the point 44 is a similar point 45 carried by the lower end of a depending finger 46 pivotally mounted for free swinging movement in a direction toward and away from the point 44 upon a bracket 47 attached to the under side of the guide 13. This swinging construction is employed to permit some additional horizontal movement of the contact carrying arm 42 after contact between the points 44 and 45 has been established. Connected to the sockets for the points 44 and 45 are current carrying wires 48 and 49 of which the former leads to the windings of an electromagnet 50 and the latter to the power input line 51 thus forming a circuit. Affected by the excitations of the magnet 50 is an armature 52 which is pivoted as at 53 and has one of its ends engaging the sliding clutch member 28.

In operation, it will be seen that upon the movement of the cigars longitudinally of the table 2, effected by the discharge mechanism of the foiling machine, the cigar at the advancing end of the row will engage the switch finger 38 swinging the same and causing the contact points 44 and 45 to engage each other. This will close the circuit in which the magnet 50 is positioned with the result that the magnet becomes energized and effects the actuation of the armature 52 which in turn moves the sliding clutch member 29 into driving engagement with the other clutch member. A drive is thereby established between the motor 29, the banding machine and the mechanism comprising the feeding device. The drive will be broken by the separation of the clutch members effected by the opening of the circuit control by the movements of the cigars over the table 2. The switch 39 is held closed by the frictional engagement of the cigar nearest the finger 38 and remains closed while the cigar is being injected under the plunger head or until 75

the rearward end of the cigar passes the free end of the finger 38 at which time the finger tends to swing outwardly by the action of the spring 53' but will, due to the movement of the incoming cigars advancing towards the finger 38, retain the circuit in a closed position. The banding machine and the feeding device are thus continuously operated during the flow of the cigars towards the finger 38. However, upon an interruption in the flow of cigars the finger 38 will be free to move to a position separating the contact points 44 and 45 and breaking the circuit, thus stopping the operation of the banding machine and the feeding plunger 11. The arrangement of the clutch mechanism is such that the machine completes the cycle and causes the plunger to come to rest at its retracted position free from engagement with the cigars. It will be noted by reference to Figures 6 and 7 that the plunger 11 is positioned or elevated above the cigars, thus permitting the incoming cigars to move into engagement with the finger 38 without interfering with the plunger upon its rearward or retracted stroke. The cigar-engaging piece 15 which is hinged at the forward end of the plunger 11 will, due to its hinged connection with the plunger 11, swing upwardly and slide over the cigar the full length thereof until free from the end of the cigar at which time the piece 15 will drop to a vertical position. This cigar engaging member 15, which is illustrated in Figure 5 to best advantage, has its upper end pivoted or hinged within the slot 54 and rounded as at 55 permitting of the free outward and upward movement of the member 15 but is prevented from swinging rearwardly and under the plunger due to the fact that the straight face 56 engages the inner end of the slot 54. This will retain the member 15 vertical and at right angles to the plunger 11 during the feeding of the cigars under the banding head. This arrangement is thought novel in that it permits the cigars to move into engagement with the finger 38 and keeps the circuit closed while the plunger is moving to its retracted position.

It will be noted that the cam 31 only functions to move the plunger element 11 to its retracted position and the spring 36 serves to move the plunger forward on its cigar injecting stroke. This is highly desirable in that in case the cigar gets out of alignment with the plunger and becomes caught in the guideway or the ejecting mechanism 57 of the banding machine fails to function properly, the damage to the cigar will be less than if the plunger were moved positively in this direction by the cam.

By pivotally mounting the contact carrying finger 46 flexibility is provided between the points 44 and 45 and permits the point 45 to move after being engaged by the other contact point, thus assuring more efficient contact therebetween. The points 44 and 45 which may be formed of any suitable metal are adjustable within their sockets and may be removed therefrom for replacement. To prevent undue sparking or arcing between the ends of the contacts 44 and 45 a condenser is positioned between the leads 48 and 49. This will increase the wearing life of the contact points and assures more effective operation of the switch device. In case the foiling machine is not in operation the row of cigars may be moved by hand longitudinally of the table until all of the cigars have passed through the banding machine by means of the feeding device, before described. In order to keep the banding machine in opera-

tion until the ejecting mechanism 57 has moved all of the cigars thereunder free from engagement therewith a switch operating rod 58 is provided along one side of the guideway 13. The rod 58 is mounted for sliding movement within brackets 59 and has one of its ends formed with a lug 60, which upon the movement of the rod in one direction will engage a spring anchoring screw 61 of the finger 38 and cause the spindle 40 to rotate effecting the closing of the circuit due to the engagement of the points 44 and 45. A spring 62 is connected with the rod 58 and serves to move the rod to an inactive or inoperative position. Adjustable stops are provided at each end of the guide 13 with which the block 12 engages. The stop serves to limit the movement of the block 12 in either direction.

Although I have described the invention herein as being used in connection with the banding of cigars, it will be understood that the device is capable of many other uses wherein it is desired to feed a plurality of articles one at a time to an operating position to be operated upon by some mechanism. Thus, for example, the device may be used in connection with candy wrapping or banding machinery or other types of wrapping or labelling machinery wherein a plurality of articles are fed to the banding, boxing or labelling machine. It will also be understood that although I have disclosed and described a foiling machine as means for moving the cigars towards the feeding device of the banding machine, other means, such as a hopper, may be provided for performing this function.

What is claimed is:

1. In a device of the character described, a table for supporting a row of pre-formed cigars, means for advancing the row of cigars over said table towards a feeding position in a non-rotating manner, means for moving said cigars one by one from feeding to banding positions, a spring for effecting the movement of said cigar moving means in the cigar injecting direction, a cam for moving said last named means to a retracted position, and switch means actuated by the moving row of cigars for electrically controlling the movement of said cam.

2. In a device of the character set forth, a substantially horizontal table for supporting a row of cigars, means for moving said row longitudinally of said table, means controlled by the movement of said row for actuating said cigars one by one in successive order transversely of said table, and a hinged cigar engaging member movable in unison with said actuating means to engage the end of an actuated cigar upon its movement transversely of the table and operable upon the retracting movement of said cigar actuating means to swing upwardly to clear said cigar.

3. In a device of the character described, a support for a row of pre-formed cigars, means for advancing the row of cigars over said support towards a feeding position, means for ejecting said cigars one by one from the advancing end of said row and transversely thereof in a horizontal plane, said means including a hinged flat member adapted to engage the end of the cigar to be ejected and which member is arranged substantially vertical during the ejecting stroke but will upon its return stroke be swung to an angle so as to clear the next succeeding cigar to be ejected.

4. In a device of the character set forth, the combination with a support for holding a row

of cigars and with means for moving the row longitudinally of said support, of a device for ejecting the cigars one by one from the advancing end of said row in a horizontal plane, said
5 device comprising a reciprocatory element positioned in a plane above said row of cigars and provided with a hinged depending cigar engaging member at its forward end, the hinge of said member permitting the latter to swing upwardly
10 and out of engagement with said row when said element is moving on its return stroke.

5. In a device of the character set forth, the combination with a support for holding a row of cigars and with means for moving the row longitudinally on said support, of a device for ejecting the cigars one by one from the advancing end of said row, said device comprising a reciprocatory element positioned for movement in a plane above said row of cigars and provided with a
15 hinged depending cigar engaging member at its forward end, said member being free to swing upwardly during the return stroke of said element permitting the row to advance towards said ejecting device.
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6. In a cigar feeding device, the combination with a suitable support for holding a row of pre-formed cigars and with means for moving said row longitudinally of said support towards the feeding position, of a plunger element mounted
5 for reciprocation above and in a direction transversely and horizontally of said row, said plunger element being provided with a depending cigar engaging member adapted to engage the ends of the cigars to eject the same one by one as the
10 row is advanced over said support.

7. In a cigar feeding device, a supporting table for a row of pre-formed cigars, means for moving the row towards one end of said table, a
15 plunger mounted for horizontal reciprocation near one end of the table in a direction transversely of said row, said plunger including a main body portion located in a plane above said support and cigars and a depending cigar engaging member carried by said body portion and adapted to engage the ends of the cigars to eject the
20 same one by one as the row is advanced over said support.

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