APPARATUS FOR APPLYING UNITING BAND MATERIAL TO GROUPS OF ROD-SHAPED ARTICLES

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ABSTRACT OF THE DISCLOSURE

Apparatus for joining tobacco rods with filter rod sections comprises a conveyor which advances groups of tobacco rods and filter rod sections past a transfer station where the groups are provided with patches of adhesive-coated uniting band material fed by a rotary advancing device. The controls which regulate the feed of uniting band material include a drive unit, a braking unit, a clutch which can connect the advancing device with the drive unit or with the braking unit, a detector which scans the conveyor for the presence or absence of groups, and an actuating device which connects the advancing device with the braking unit when the detector detects the absence of groups on the conveyor.

The present invention relates to apparatus for applying uniting band material to groups of rod-shaped articles. More particularly, the invention relates to apparatus for applying patches of adhesive-coated uniting band material to groups of coaxial articles which may include two or more filter plugs or one or more filter plugs and one or more tobacco rods. For example, the apparatus of my invention may be adapted for joining filter plugs of double unit length with pairs of coaxial cigarette rods of unit length to form filter cigarettes or double unit length, or for joining two or more filter plugs into a multiplex filter plug.

In filter cigarette machines, cigarette rods and filter plugs are joined in sequence by means of adhesive-coated patches which are obtained on subdivision of a continuously advancing uniting band. The band is being withdrawn from a bobbin and one of its sides is coated with adhesive paste as it advances toward a transfer station where the patches are applied to consecutive groups of aligned cigarettes and filter plugs. Prior to reaching the transfer station, the band is subdivided into patches of requisite size, and such patches are applied to consecutive groups by means of a rotary suction drum in a manner well known from the art of filter cigarette making. The feed for the uniting band must be interrupted as soon as the feed of grouped rod-shaped articles is interrupted for whatever reason, e.g., due to malfunction of the conveyor, because the patches might contaminate the machine or might cause a complete breakdown if they are permitted to enter between certain moving parts.

It is already known to advance the uniting band by passing it between two rollers one of which is driven to draw the band off the bobbin. In the event of an interruption in the feed of cigarette rods and/or filter plugs, one of the rollers is moved away from the other roller to thereby interrupt the feed of band material. At the same time, the band is disengaged from the pasters and is gripped by a suitable braking device to positively prevent further advance of the band toward the transfer station. Reference may be had, for example, to U.S. Patent No. 3,081,778. However, it was found that the just outlined safety features cannot insure sufficiently rapid interruption in the feed of uniting band, mainly because the aforementioned suction drum continues to rotate and tends to entrain the uniting band after the actual drive for the band is disengaged therefrom. In accordance with a further proposal, the bearing may be controlled in which the uniting band is stored supports the bobbin with considerable friction so that the band is maintained under tension and is more likely to be arrested without undue delay. A drawback of such constructions is that the band is likely to tear because its material is rather weak.

Accordingly, it is an important object of the present invention to provide an apparatus for controlling the feed of uniting band material to a transfer station where patches of such band material are being applied to groups of travelling axially aligned rod-shaped articles and to provide the apparatus with means adapted to regulate the feed of uniting band material in such a way that delays in the interruption of feed will develop only when such delays are actually desired.

Another object of the invention is to construct the apparatus in such a way that the feed of uniting band material may be interrupted with a minimum of delay and without tearing or otherwise damaging the band.

A further object of the instant invention is to provide an apparatus for joining groups of coaxial rod-shaped articles by patches of adhesive-coated uniting band material and to construct the apparatus in such a way that the feed of band material may be controlled by two or more factors and that interruptions in the feed of band material may be accomplished by automatic interruption in the feed of groups.

An additional object of the invention is to provide a novel clutch which controls the operation of advancing means for uniting band material.

Briefly stated, one feature of my present invention resides in the provision of an apparatus joining coaxial rod-shaped articles by means of adhesive-coated uniting band material. The apparatus comprises means for feeding groups of coaxial articles sideways along a predetermined path and past a transfer station, means for feeding band material to the transfer station, means for subdividing the moving material into patches and for applying consecutive patches to successive groups at the transfer station, means for scanning the path for the presence and absence of groups, means for interrupting the feed of band material in response to detection of absence of such groups, and means for applying a braking force to the advancing mechanism for the band material simultaneously with uncoupling of the advancing mechanism from its drive. If the path is scanned at a single point, such point may be located upstream or downstream of the transfer station, preferably downstream. However, it is also possible to scan the path both upstream and downstream of the transfer station and to restart the feed for uniting band material only when the groups are detected at both scanning points.

In accordance with another feature of the invention, the feed of one or more components of each group may be interrupted simultaneously with an interruption in the feed of band material to prevent waste. For example, the components of each group may include one or more tobacco rods and one or more filter plugs or two or more filter plugs, depending upon whether the apparatus is used in the production of filter cigarettes or composite (multiplex) filter plugs.

The novel features which are considered as characteristic of the invention are set forth in particular in the appended claims. The improved apparatus itself, however, both as to its construction and its mode of operation, together with additional features and advantages thereof, will be best understood upon perusal of the following detailed description of certain specific embodi-
ments with reference to the accompanying drawings, in which:

FIG. 1 is a diagrammatic side elevational view of a filter cigarette machine which embodies one form of the improved apparatus;

FIG. 2 is an enlarged fragmentary sectional view substantially as seen in the direction of arrows, from the line II—II of FIG. 1 and illustrates a clutch which is used to control the advancing means for uniting band material;

FIG. 3 is a circuit diagram showing a portion of a modified apparatus; and

FIG. 4 is a fragmentary side elevational view of a filter machine which embodies a different apparatus.

Referring first to FIGS. 1 and 2, there is shown a filter cigarette machine wherein two types of rod-shaped articles, namely, pairs of coaxial cigarette rods 3 of unit length and filter plugs 6 of double unit length, are joined by an apparatus which wraps patches 11 of adhesive-coated uniting band material 14 around the filter plugs 6 and around the adjoining end portions of the cigarette rods 3. The apparatus comprises a conveyor including two cooperating rotary drums 4 and 9 which advance groups 8 (each composed of two coaxial cigarette rods 3 and a filter plug 6 therebetween) toward past and beyond a transfer station 10 which is adjacent to a portion of the second drum 9. The feed for supplying pairs of coaxial but spaced cigarette rods 3 into consecutive pockets or holders 4a of the drum 4 comprises an inclined chute 2 and a rotary transfer drum 1. The drum 1 is also provided with axially parallel pockets or holders 1a and is partially surrounded by one or more arcuate shields 1b which retain the cigarette rods 3 during travel to the point of transfer between the drums 1 and 4. Similar shields 4b and 9b surround portions of the drums 4 and 9. The feed for filter plugs 6 comprises an inclined chute 7 and a rotary drum 5 having axially parallel pockets 5a and cooperating with arcuate retaining shields 5b. The arrangement is such that the pockets 5a discharge filter plugs 6 into gaps between pairs of cigarette rods 3 in the pockets 4a of the drum 4. The thus obtained groups 8 are then conveyed between inclined conveying or shifting chains 4c which cause the cigarette rods 3 to move axially toward the adjoining ends of the aligned filter plugs. The groups 8 are then transferred into consecutive pockets 9a of the drum 9 and travel along the shields 9b toward and past the transfer station 10.

The aforementioned apparatus further comprises a bobbin 17 or a similar source of uniting band material, advancing means for withdrawing such material from the bobbin 17, and a novel control assembly for regulating the feed of band material to the transfer station 10. The advancing means includes a driven advancing roller 15 and an idler roller 16. The web 14 of uniting band material is guided through the gap between the rollers 15, 16 and is being paid out by the bobbin 17 as long as the roller 15 rotates. The underside of the web 14 is then guided along a paster roller 18 of conventional design which coats the web with a film of adhesive. The roller 18 receives adhesive from an intermediate roller 18a which dips into a supply of adhesive contained in a paste pot 18b. The thus coated web is then guided around a revolving suction drum 12 which serves as a means for applying patches 11 to consecutive groups 8. The patches 11 are formed by a revolving knife 13 which cooperates with the suction drum 12 and severs the web 14 at regular intervals. The rollers 15, 16 move the web 14 at a speed which is somewhat less than the peripheral speed of the suction drum 12 so that each freshly severed patch 11 moves away from the leading end of the remainder of the web 14 to insure unobstructed transfer to the respective group 8.

Each group 8 which has advanced past the transfer station 10 carries a patch 11, and such patches may extend substantially tangentially of the respective filter plugs 6.

The groups are then advanced along arcuate shields 9c and are transferred into consecutive pockets 19a of a rotary wrapping drum 19 surrounded by a shield 19b. While travelling with the drum 19, the patches 11 are con- arounded with respect to the respective filter plugs 6 and around the adjoining end portions of the cigarette rods 3 to be transformed into tubes which in turn are conveyed into the holes of respective filter cigarettes 20 with the respective filter plugs 6 and to transform each group 8 into a filter cigarette 20 of double unit length. Such cigarettes 20 are thereafter transferred into consecutive pockets 21a of a so-called cutting drum 21 which is surrounded by shields 21b and advances the cigarettes past a rapidly revolving die-shaped cutter 22 so that the cigarettes 20 are severed in planes extending midway across the convoluted patches 11 and yield pairs of filter cigarettes 23 of double unit length. The cigarettes 23 are deposited onto the upper stringer of a transporting belt 24 which advances them to storage in a station where the cigarettes are transferred into trays, or directly to a packing machine.

With the exception of the advancing means 15, 16 and of the aforementioned control assembly, the hereinafter described components of the filter cigarette machine are well known in the art and by themselves form no part of my present invention.

The invention resides mainly in the provision of the control assembly and in the manner in which the control assembly may regulate the feed of uniting band material and, if desired, the feed of cigarette rods 3 and/or filter plugs 6. This control assembly includes a drive unit for the roller 15, a braking unit 41, a clutch 35 which can couple the roller 15 with the drive unit or with the braking unit (but not with both units at the same time), a detector assembly including two detecting or scanning members 25, 27 and an actuating assembly including two electric switches 26, 28. The detector assembly serves to uncouple the clutch 35 from the drive unit or from the braking unit, depending upon whether or not one of the scanning members 25, 27 has detected the presence or absence of assemblies 8 on the conveyor which includes the drums 4 and 9. The scanning member 25 constitutes a trip for the switch 25 which is normally open, and the scanning member 27 constitutes a trip for the normally open switch 28. These switches are connected in parallel and their circuit further includes a suitable source 30a of electrical energy. A first conductor 30 connects the source 30a with the switch 26; a second conductor 31 connects the solenoid with one contact of the switch 28; a third conductor 33 connects this one contact of the switch 28 with one contact of the switch 26; a fourth conductor 34 connects the other contact of the switch 28 with the other contact of the switch 28; and a fifth conductor 32 connects the other contact of the switch 28 with the other pole of the source 30a. The trip 25 is adjacent to the periphery of the drum 4, i.e., it is located upstream of the transfer station 10 and is arranged to scan the drum 4 for the presence or absence of entire groups 8 or for the presence or absence of one or two rod-shaped components of such groups. In other words, the trip 25 may detect that an entire group 8 is missing, that a pocket 4a contains only one or two cigarette rods 3, or that a pocket 4a contains only a filter plug 6 or a filter plug and a single cigarette rod. The length of the trips 25 and 27 is such that each thereof remains energized because the switches 26 and 28 are connected in parallel. If the trip 25 and switch 26 were installed in the zone between the transfer drums 1 and 5, the trip 25 could only detect the presence or absence of one or both cigarette rods 3. When the filter cigarette
Machine operates properly, the trips 25 and 27 are lifted by the groups 8 which advance therebelow so that the circuit of the switches 26, 28 is open and the solenoid 29 is deenergized. The trip 27 and the switch 28 are located downstream of the transfer station so that the trip 27 can detect the presence or absence of groups 8 which are already provided with patches 11.

The solenoid 29 comprises a reciprocable armature 29a (see Fig. 2) which can move the dog 35a of the clutch 35 to a first end position. The dog 35a is biased by a spring 35c which tends to move it to a second end position. When the solenoid 29 is energized, it expels the armature 29a (i.e., the armature then moves in a direction to the left, as viewed in Fig. 2), so that the dog 35a is locked against the bias of the spring 35c and is disengaged from the teeth of a clutch element 35d. One arm of the dog 35a then bears against an internal braking surface 41 provided on the stationary braking unit 41. As shown, the dog 35a resembles a two-armed lever and is mounted on a pivot pin 35e carried by a clutch element 35f affixed to the shaft 36 of the driven advancing roller 15. The clutch element 35f is rigid or integral with a pinion 37 which forms part of the drive unit for the roller 15, this drive unit further including a gear 38 which meshes with the pinion 37. The pinion 37 and gear 38 which is coaxially secured to the gear 38, and a further gear 20 which drives the pinion 39. The drive unit, the shaft 36 of the roller 15, and the shaft 16a of the idler roller 16 are mounted on a plate-like frame member F which preferably supports the entire filter cigarette machine. The gear 20 is driven by a suitable transmission from the main drive shaft of the machine or directly by an electric motor, not shown. The pinion 37 and the clutch element 35d are rotatable with reference to the roller shaft 36.

The operation of the filter cigarette machine is as follows:

If there is an interruption in the feed of cigarette rods 3 and/or filter plugs 6, the trip 25 descends to the position of Fig. 1 as soon as it is bypassed by the last complete group 8 whereby the switch 26 closes and the solenoid 29 is energized. The armature 29a is expelled and the dog 35a is positioned to the position of Fig. 2 whereby the dog disengages the clutch element 35f from the clutch element 35d (i.e., it disconnects the roller 15 from the drive unit) and simultaneously couples the roller 15 with the braking unit 41 by bearing against the stationary braking surface 41. This brings the roller 15 to an immediate halt, together with the web 14 so that the suction drum 12 cannot apply patches 11 to the groups 8.

The suction prevailing in the interior of the drum 12 is selected in such a way that the leading end of the web 14 adheres to the periphery of the drum but cannot tear if the drum 12 continues to rotate after the roller 15 is arrested. The slippage between the web 14 and the drum 12 simply increases but the web remains intact. The magnitude of the force produced by the drum 12 which tends to move the web 14 lengthwise may be regulated by changing the area of contact between the periphery of this drum and the web.

The apparatus of my invention may be further provided with a device which lifts the web 14 away from the pasty roller 18 as soon as the solenoid 29 is energized. For example, such a device may comprise a lifting roller which is mounted between the roller 15 and 18 and moves upwardly as soon as the circuit of the solenoid 29 is completed, either by receiving motion directly from the armature 29a or from the armature of a second solenoid which is connected in series with the solenoid 29. The web 14 remains disengaged from the roller 18 until the dog 35a repels the driving connection between the pinion 37 and the shaft 36.

If the disturbance in the feed of cigarette rods 3 and/or filter plugs 6 is eliminated and a freshly assembled group 8 again lifts the trip 25, the latter opens the switch 26 so that the solenoid 29 is deenergized and retracts the armature 29a whereby the spring 35c is free to rock the dog 35a back into engagement with the teeth of the clutch element 35d to couple the drive unit with the advancing roller 15. Of course, such deenergization of the solenoid 29 can take place only if the switch 25 is also open. However, the switch 25 can open only after a fresh row of groups reaches the second trip 27 so that the solenoid 29 remains in energized condition despite the fact that the switch 26 might be open due to the presence of groups 8 in the space below the trip 25. In other words, the roller 15 will begin to feed the web 14 only when a continuous row of groups 8 extends all the way across the drum 12 so that these trips open the switches 26 and 28.

As stated before, the trips 25 and 27 may be constructed and configured in such a way that each thereof can detect the presence of one, two or all three rod-shaped components of a group 8. For example, each of these trips may comprise three fingers each of which can scan the drum 4 or 9 for the presence of a single cigarette or filter plug. Each finger can by itself open or close the corresponding switch 26 or 28.

While it would be possible to omit one of the trips 25, 27, the actuating 39 assembly which includes two trips is preferred for the following reasons. If the trip 25 of Fig. 1 were without the trip 25, the trip 27 could detect the absence of groups 8 only at a time when at least one patch 11 was already transferred to the drum 9 without meeting a group of cigarette rods and filter plugs. In other words, such patch or patches could contaminate the machine. In the absence of the trip 27, the roller 15 would begin to feed the web 14 as soon as the trip 25 would detect a group 8 whereby the suction drum 12 would again transfer patches 11 to a series of empty pockets 9a before the patches would begin to meet properly assembled groups of filter plugs and cigarette rods. In other words, by using two trips which are respectively disposed upstream and downstream of the transfer station 10, I insure that the patches 11 cannot be applied to the drum 9. However, it is equally within the purview of my invention to omit one of the trips 25, 27 and to control the feed of uniting band material by a single detecting member which may be installed upstream or downstream of the transfer station. If the trip 25 is used alone, the circuit of the solenoid 29 preferably includes a suitable time-lag relay which delays the coupling of the shaft 36 with the pinion 37 for an interval of time long enough to insure that the foremost group 8 at least reaches the transfer station 10 when the drum 12 begins to apply patches 11.

It is often desirable to interrupt the feed of filter plugs 6 and/or cigarette rods 3 simultaneously with an interruption in the feed of uniting band material. For example, the filter cigarette machine of Fig. 1 may be provided with a clutch which disengages the transfer roller 15 from its drive simultaneously with energization of the solenoid 29 so that the operator may eliminate a disturbance in the feed of filter plugs 6. In the absence of such a clutch, all of the filter plugs 6 which would be fed subsequent to a disturbance in the feed of cigarette rods 3 would go to waste and could eventually clog up the machine. As indicated in Fig. 1 by phantom lines, the switch 26 may constitute a double-pole switch which is connected with conductors 69, 70 forming part of an actuating assembly for a clutch serving to couple the shaft 5d of the transfer drum 5 with a drive unit only when a trip 25 is made. As indicated in Fig. 1, merely indicates a solenoid 71 which may be energized when the switch 26 is allowed to close in response to detection of the absence of a group 8 or of cigarette rods 3 so as to effect an immediate braking action upon the shaft 6 and to prevent further feed of filter plugs 6.

FIG. 3 illustrates a modified actuating device for the clutch 35. This actuating device comprises a solenoid 129 having a reciprocable armature 129a, and two electric switches 126, 128 which are connected in series. These
switches are normally biased to closed positions but may be opened by two trips 125, 127 which correspond to the trips 25, 27. The solenoid 129 is normally energized and then retracts the armature 129a so that the dog 35 of the clutch 35 can couple the drive unit with the roller 15.

When one of the trips 125, 127 detects the absence of 60 of a guard 59, it opens the respective switch 126 or 128 so that the solenoid is deenergized whereby a spring 129b expels the armature 129a and the latter causes the dog 35a to couple the roller 15 with the braking unit 41.

Referring finally to FIG. 4, there is shown a machine for the production of so-called multiple filters, i.e., for the production of composite filters which consist of two or more different filter materials. This machine again comprises a conveying unit to include two cooperating drums 51, 54 which transport groups 29 of coextant filter rod sections 50 past a transfer station 56 which is adjacent to the drums 51, 54. The pockets of the drum 51 receive such groups from a feed which includes four coaxial transfer drums 46, 47, 48, 49 which respectively cooperate with chutes 42, 43, 44 and 45. Each chute supplies to the respective transfer drum a different filter plug 50 of unit length or multiple unit length.

The width of the web 59 is such that patches 57 of this web may be convoluted around all of the filter plugs 50 which form a group 52. The groups 52 which have advanced past the transfer station 56 and are provided with patches 57 as are then transferred into the pockets of a wrapping drum 63 which completes the wrapping of patches 57 around the respective groups 52 and transforms each such group into a multiplex filter rod 64.

The web 59 is being withdrawn from a suitable bobbin (not shown) by means of an advancing unit including a driven roller 60 and an idle roller 61. The underside of the web 59 is coated with adhesive by a paste roller 62 and the web is then guided around a suction drum 55 which cooperates with a revolving knife 58 to form the patches 57.

The advancing roller 60 may be coupled with a drive unit or with a braking unit in the same way as shown in FIG. 2. FIG. 4 merely shows the actuating device and the detector which latter includes a single trip 53 adjacent to the drum 51, i.e., upstream of the transfer station 56. This trip 53 controls an electric switch 65 which forms part of the actuating device and is connected in circuit with a solenoid 68 by means of conductors 66, 67. The circuit further includes a source 66a of electrical energy. The wrapping drum 63 delivers the filter rods 64 to a cutting drum, to storage or directly to a filter cigarette machine wherein the rods 64 may be severed to yield filter plugs or desired length.

If the trip 53 detects the absence of a single group 52 or of two or more groups, it moves to the lower end position shown in FIG. 4 and causes the switch 65 to close so as to energize the solenoid 68 whereby the armature of the solenoid causes the clutch (not shown) to couple the roller 60 with the braking unit. The circuit of the solenoid 68 includes a suitable time-lag relay 75 which serves to delay the energization of the solenoid for an interval of time which suffices to insure that all of the groups which happen to be located between the trip 53 and the suction drum 55 will advance beyond the trip 53 before the feed of the web 59 is interrupted. The relay 75 further insures that, when the trip 53 is lifted in response to detection of a fresh group 52', the solenoid 68 is de-energized with such a delay that the group 52' can reach the transfer station 56 at the time when the suction drum 55 transfers the foremost patch 57.

In other words, the function of the relay 75 is to insure that the suction drum 55 will transfer patches 57 only and alone at such times when the groups 52 actually travel past the transfer station 56.

A very important feature of my improved apparatus is believed to reside in that the web 14 or 59 need not be directly subjected to the action of a braking device.

Thus, instead of directly braking the web, I prefer to apply a braking action to the advancing roller 15 or 60. This roller need not be swung to and from the idler roller 16 or 61 so that the feed for the uniting band material is of rather simple and rugged design. The braking action upon the roller 15 can begin simultaneously with an interruption of driving connection between the driving unit and the roller 15 or 60 so that full braking action can be applied practically without any delay. It was found that such application of the braking force results in more rapid interruption in the feed of uniting band material. The clutch 35 is a very simple device which can be readily installed in presently known filter machines or filter cigarette machines without necessitating any appreciable alterations in the mounting and/or operation of the remaining parts.

While it is possible to connect the clutch 35 and the detecting members 25, 27 or 53 by means of more complicated (mechanical or pneumatic) actuating assemblies, an electrical actuating assembly which includes the solenoid 29, 129 or 68 has been found to be particularly suited because it can transmit signals or impulses without delay and is much less prone to malfunction than a mechanical or pneumatic device.

Without further analysis, the foregoing will so fully reveal the gist of the present invention that others can, by applying current knowledge, readily adapt it for various applications without omitting features which fairly constitute essential characteristics of the generic and specific aspects of my contribution to the art and, therefore, such adaptations should and are intended to be comprehended within the meaning and range of equivalent of the following claims.

What is claimed is new and desired to be protected by Letters Patent is:

1. An apparatus for joining coaxial rod-shaped articles by uniting band material, particularly for joining tobacco rods and/or filter plugs, comprising conveying means for feeding groups of rod-shaped articles past a transfer station; a source of uniting band material; rotary advancing means for feeding such material from said source to said transfer station; and control means for regulating the feed of band material including a drive unit and a braking unit for said advancing means, clutch means for coupling said advancing means with one of said units at a time, detector means for sensing said conveying means for the presence and absence of groups, and actuating means connecting said detector means with said clutch means so as to couple said advancing means with said braking unit in response to the absence of groups on said conveying means.

2. An apparatus as set forth in claim 1, wherein said clutch means comprises a dog movable by said actuating means between first and second positions in which said advancing means is respectively coupled with said drive unit and said braking unit.

3. An apparatus as set forth in claim 2, wherein said braking unit comprises a fixed braking surface and wherein said dog engages said braking surface in the respective position thereof to thereby hold said advancing means against rotation.

4. An apparatus as set forth in claim 1, wherein said detector means comprises a detecting member which is located upstream of said transfer station.

5. An apparatus as set forth in claim 1, wherein said detector means comprises a detecting member which is located downstream of said transfer station.

6. An apparatus as set forth in claim 1, wherein said detector means comprises two detecting members which are respectively located upstream and downstream of said transfer station.

7. An apparatus as set forth in claim 7, wherein said detector means comprises two detecting members which are respectively located upstream and downstream of said transfer station.

8. An apparatus as set forth in claim 7, wherein said
actuating means is arranged to couple said advancing means with said braking unit when at least one of said detecting members detects the absence of groups on said conveyor means.

9. An apparatus as set forth in claim 1, wherein said actuating means comprises an electric switch which is movable between open and closed positions and normally assumes one of said positions, said detector means comprising a trip which moves said switch to the other position in response to detection of the absence of groups on said conveyor means.

10. An apparatus as set forth in claim 1, further comprising a feed for supplying rod-shaped articles to said conveyor means upstream of said transfer station and means for arresting said feed in response to detection of the absence of groups by said detector means.

11. An apparatus as set forth in claim 1, wherein said actuating means comprises two electric switches each of which is movable between open and closed positions and normally assumes one of said positions, said detector means comprising two trips respectively located upstream and downstream of said transfer station and each arranged to move the corresponding switch to the other position upon detection of the absence of groups on said conveyor means, said clutch means being arranged to couple said advancing means with said braking unit when at least one of said switches is moved to said other position.

12. An apparatus as set forth in claim 11, wherein each of said switches is open in said one position thereof and wherein said switches are connected in parallel, said actuating means comprising a solenoid connected in circuit with said switches and having a movable armature which operates said clutch means to couple said advancing means with said braking unit when said circuit is completed across at least one of said switches to energize said solenoid.

13. An apparatus as set forth in claim 11, wherein each of said switches is closed in said one position thereof and wherein said switches are connected in series, said actuating means further comprising a solenoid connected in circuit with said switches and having a movable armature which operates said clutch means to couple said advancing means with said braking unit when at least one of said switches is open to thus deenergize said solenoid.

14. An apparatus as set forth in claim 1, wherein said actuating means comprises a delay device arranged to effect coupling of said advancing means with said drive unit with a delay following detection of groups by said detector means and to effect coupling of said advancing means with said braking unit with a delay following detection of the absence of groups on said conveyor means, said detector means comprising a detecting member located upstream of said transfer station and said delays being of such duration that a group detected by said detecting member reaches the transfer station when said advancing means is coupled to said drive unit and that the last group preceding detection of the absence of groups on said conveyor means reaches the transfer station prior to interruption of feed by said advancing means.

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