May 1, 1951 J. A. GILBERT 2,550,920

WRAPPING MACHINERY

Filed Oct. 3, 1946 3 Sheets-Sheet 1

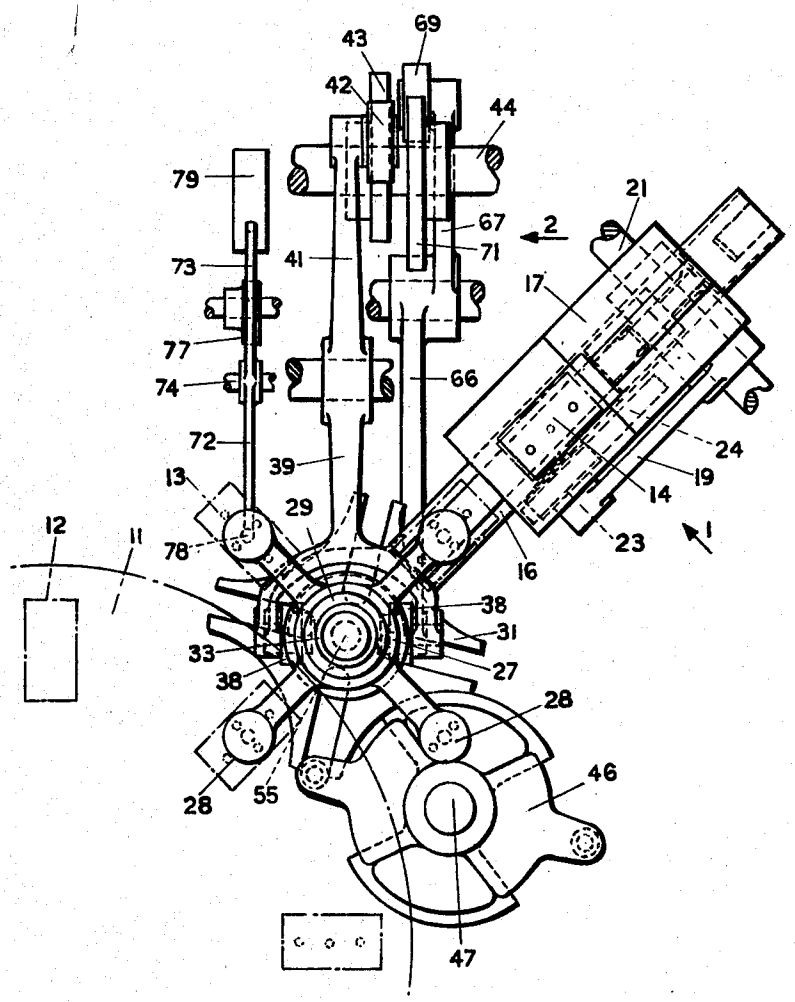

FIG.1.

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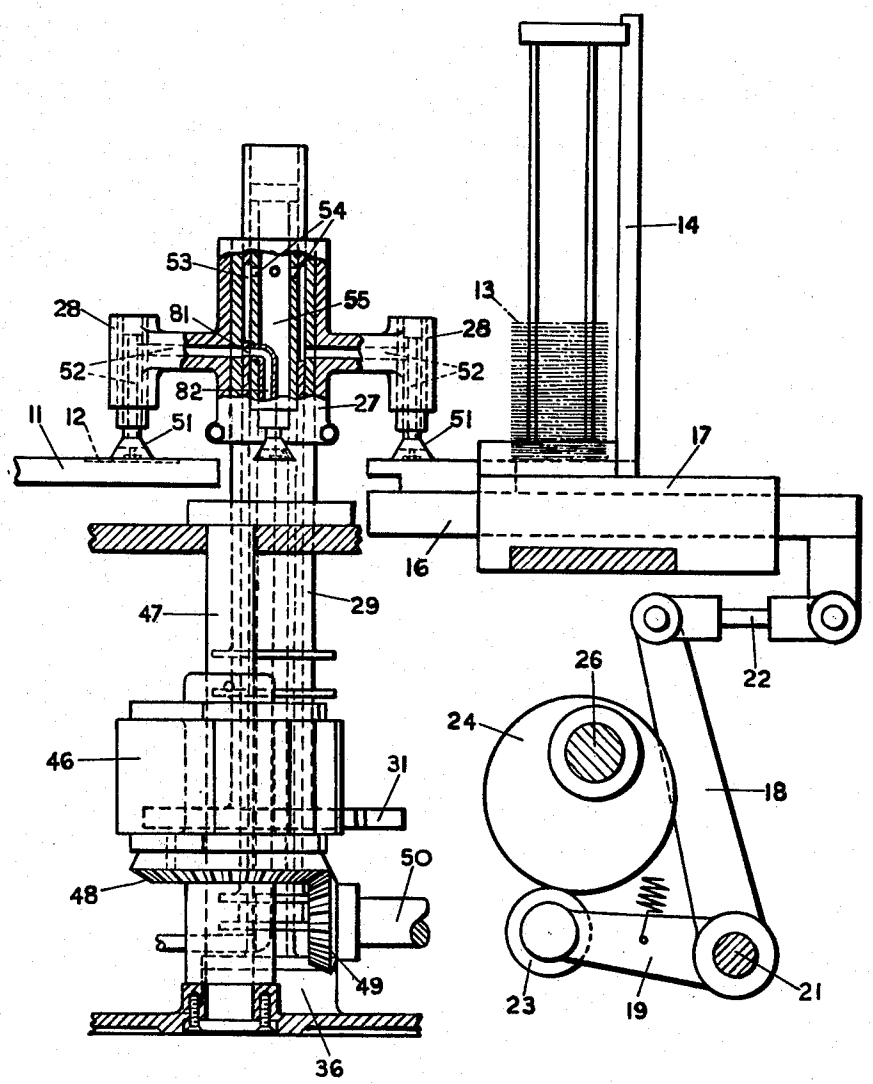

FIG. 2.

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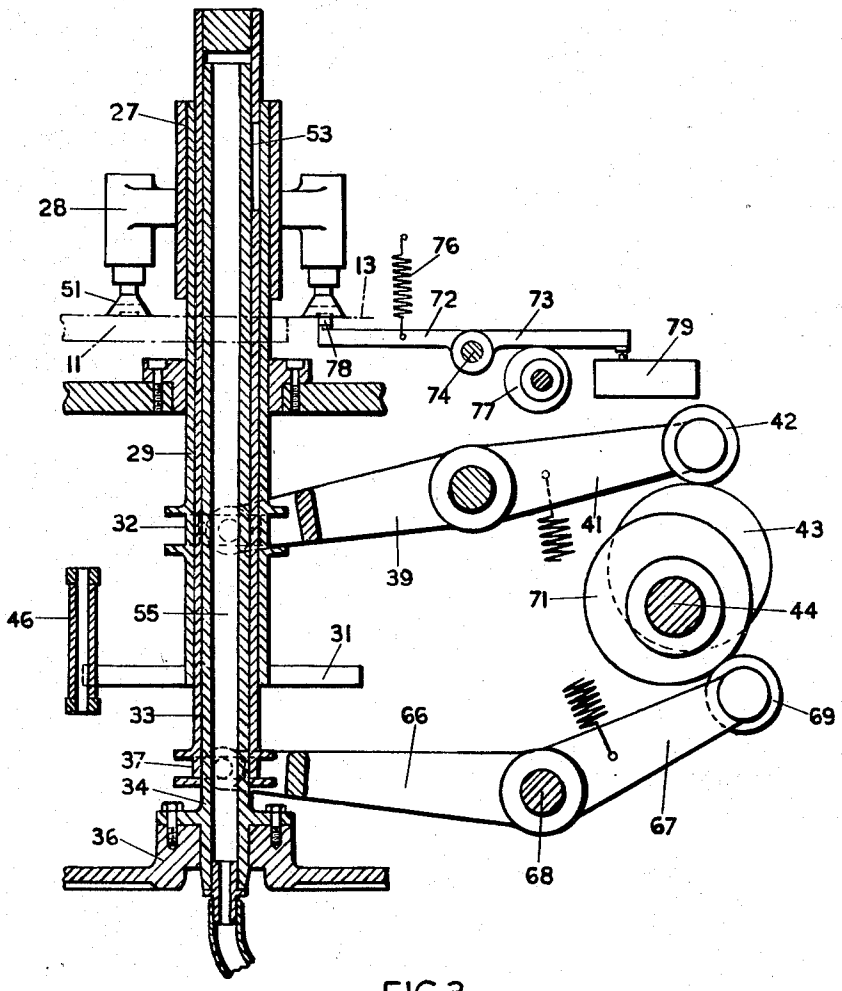

FIG.3.

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UNITED STATES PATENT OFFICE

2,550,920

WRAPPING MACHINERY

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4 Claims. (Cl. 93—2)

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This invention relates to machines for wrapping razor blades or other articles requiring similar manipulation (hereinafter referred to as "blades"), and more particularly to the feeding of the blades to the wrapping elements of such machines.

According to the invention, there is provided a wrapping machine wherein the blades are fed from a source of supply by an intermittently rotatable transfer member comprising two or more feeding members each adapted in turn to seize a blade from the source of supply and transfer it to the wrapping elements. Preferably, the arrangement is such that one feeding member seizes a blade from the source of supply at the same time as another feeding member delivers its blade to the wrapping elements. The transfer member may comprise three, four, six, eight, or more feeding members and there may be arranged, between the source of supply and the wrapping elements one or more intermediate stations at which further functions are performed as the blades pass. For instance, there may be a detecting station at which the presence or absence of a blade is determined by a detecting device which, upon detecting the absence of a blade from any feeding member, operates a mechanism for removing the faulty package from the machine.

The feeding members on the transfer member may be arranged to pick up the blades by suction, or magnetically, or in any other suitable manner, and means may be provided for stripping the blade from the feeding member as it is delivered to the wrapping elements. Such stripping means may comprise a blast of air directed down a central nozzle in the feeding member, or there may be provided a pair of stripping fingers arranged to hold the blade in position as the feeding member is withdrawn after delivering the blade.

The source of supply of blades may be in the form of a magazine containing a stack of blades, the blades being fed singly from the base of the magazine on to a suitable guiding member from which they are picked up in turn by the feeding members.

The invention has been found particularly useful as applied to the wrapping of razor blades by a machine of the same general kind as that described in my copending United States Application Ser. No. 646,152, filed February 7, 1946, now Patent No. 2,545,273, March 13, 1951, corresponding to British Patent Application No. 2194/45, filed January 27, 1945. Such an application of

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the invention will now be described, by way of example, with reference to the accompanying diagrammatic drawings, in which,

Figure 1 is a plan view of a portion of a razor blade wrapping machine, showing the blade-feeding station,

Figure 2 is a part-sectional elevation of the apparatus shown in Figure 1, viewed in the direction of the arrow 1 in Figure 1, and

Figure 3 is a conventional section of a portion of the apparatus shown in Figure 1, viewed in the direction of the arrow 2 in Figure 1.

In general, the wrapping machine comprises a pocket wheel 11 formed with a series of pockets 12 of a size appropriate to the blades 13, the pocket wheel 11 being caused to rotate through a portion of a revolution at a time so as to bring each pocket 12 to rest in turn at each of a series of stations disposed around the periphery of the pocket wheel. During each rest period of the pocket wheel 11, an operation is performed at each station, and in this manner a completely wrapped blade is delivered at the delivery station at each movement of the pocket wheel.

The mechanism at the blade-feeding station will now be described, reference being made to the abovementioned specification for further details of the general construction and operation of the machine, as a whole, if required.

The blades 13 are fed from the base of a magazine 14 by a pusher member 16 arranged to slide in a track 17 forming part of the main framework of the machine, the pusher 16 being reciprocated by means of a two-armed lever 18, 19, pivoted at 21, the arm 18 being connected to the pusher 16 by means of a pivoted link 22, while the arm 19 carries a freely mounted roller 23 arranged to bear against the face of a rotatable cam 24 secured to a shaft 26 which is arranged to be rotated in timed relationship with the pocket wheel 11. The pusher 16 carries the blades 13 to a position adjacent a rotatable transfer member 27 which is formed with four radial feeding members 28 each arranged in turn to pick up a blade from the pusher 16.

The transfer member 27 is attached to a sleeve 29 at the base of which is formed the slotted member 31 of a Geneva mechanism. The sleeve 29 is formed with an annular groove 32 and is freely mounted on a sleeve valve 33 itself freely mounted on a central supporting pillar 34 attached to a boss 36 forming part of the main framework of the machine. The sleeve valve 33 is also formed with an annular groove 37 for a purpose to be described later.

Arranged in engagement with the recess 32 is a pair of shoes 38 freely mounted in a forked arm 39 of a two-armed lever 39, 41, the arm 41 being provided with a freely mounted cam roller 42 arranged to bear against the face of a rotatable cam 43 secured to a cam shaft 44 driven in timed relationship with the pocket wheel 11. The slotted member 31 is arranged in engagement with the crank member 46 of the Geneva mechanism which is freely mounted on a stationary shaft 47 secured in the main framework of the machine. The crank member 46 is of sufficient depth to allow of axial movement of the sleeve 29 by the lever 39, 41. The Geneva mechanism is driven by means of a bevel gear 48 secured to the crank member 46 and arranged in engagement with a further bevel gear 49 attached to a shaft 50 arranged to be driven in timed relationship with the pocket wheel 11.

The feeding members 28 are each formed with a suction nozzle 51 to which suction is applied through ports 52 in the feeding members 28, a suction chamber 53 formed in the sleeve valve 33, and ports 54 leading to a central suction chamber 55 formed in the pillar 34, suction being applied to the chamber 55 by means of a pump in known manner.

In operation, as each pocket 12 (to which a liner and wrapper has previously been supplied) of the pocket wheel 11 comes to rest at the blade-feeding station, a blade 13 is delivered to the pocket by a feeding member 28 at the same time as a further blade is picked up from the pusher 16 by the suction nozzle 51 of the diametrically opposed feeding member 28 in the following manner.

As the pocket wheel 11 comes to rest, the pusher 16 also comes to rest in its forward position after removing a blade from the base of the magazine 14, and at this time the transfer member 27 is just coming to rest after completing a quarter of a revolution under the influence of the Geneva mechanism 31, 46, with opposed feeding members 28 immediately above the adjacent pocket 12 and the blade 13 on the pusher 16, respectively, and the transfer member 27 is just approaching the bottom of its downward movement under the influence of the cam 43 and the two-armed lever, 39, 41, which serves to reciprocate the sleeve 29 in timed relationship with the movement of the pocket wheel 11 at the same time as the sleeve 29 is being rotated by the Geneva mechansms 31, 46. In the drawings, the transfer member 27 is shown in its lowermost position where one feeding member 28 is about to pick up a blade from the pusher 16 and the opposing feeding member 28 is about to deliver its blade to the adjacent pocket 12 of the pocket wheel 11.

The sleeve valve 33 is also arranged for axial movement under the influence of a two-armed lever 66, 67, pivoted at 68, the arm 66 being forked and provided with a pair of shoes arranged to run in the annular groove 37, while the arm 67 is provided with a freely mounted cam roller 69 arranged to bear against the face of a rotatable cam 71 secured to the shaft 44. The shape of the suction chamber 53 and the timing of the cam 71 are such that suction is applied to the ports 52 a little before the nozzle 51 descends on to the blade 13 on the pusher 16 and continues until the blade is delivered into the pocket 12 when the port 52 in the adjacent feeding member 28 is cut off from the chamber 53 by further movement of the sleeve valve 33, such movement continuing until a pressure port 81 in the sleeve valve 33 lies in register with the bore of a blast pipe 82 extending through the walls of the sleeve valve 33 and being fed with air under pressure from any convenient source. It will thus be seen that, as the blade is delivered to the pocket 12, it is removed from the nozzle 51 by a blast of air from the blast pipe 82.

Substantially simultaneously with the delivery of the blade 13 into the pocket 12, the sleeve 29 again starts to move upwardly under the influence of the cam 43 to cause the feeding member 28 adjacent the pocket wheel to lift clear of the pocket 12 and the upstanding wrapper, and the opposing feeding member 28 to lift a blade clear of the pusher 16, and as soon as the feeding members 28 are clear, the transfer member 27 and the pocket wheel 11 are caused once more to rotate through a portion of a revolution and the cycle of operations is repeated, the pusher 16 being withdrawn and moved forward to carry another blade 13 into the feeding position during each movement of the transfer member 27.

As mentioned above, the transfer member 27 is caused to move through a quarter of a revolution for each movement of the pocket wheel 11 and it will thus be seen that after a blade has been picked up from the pusher 16, it is brought to rest at an intermediate station before being carried on to the pocket 12 of the pocket wheel. The intermediate station is utilised as a detecting station, and immediately the feeding member 28 comes to rest at the detecting station, a two-armed detecting lever 72, 73, pivoted at 74, is allowed to rock under the influence of a spring 76 by a rotatable cam 77 operating in timed relationship with the rotation of the transfer member 27. The rocking of the detecting lever 72, 73, causes a detector 78 on the arm 72 to move into contact with the blade, and if for any reason a blade is not present, the detector 78 moves beyond the plane normally occupied by the blade 13 into a suitable recess formed in the nozzle 51, the excess movement causing the arm 73 to operate a micro switch 79 which, in turn, brings into operation a delayed action mechanism for removing the empty package from the pocket wheel at a later stage. Such a mechanism is fully described in the above-mentioned specification.

I claim:

1. A device for feeding razor blades or like articles from a source of supply to a wrapping machine, comprising a cylindrical supporting column, an intermittently rotatable suction transfer member rotatably mounted on said column and slidable thereon in axial directions, said transfer member being formed with at least two feeding members provided with suction passages and each adapted in turn to seize an article by suction contact with its upper surface and transfer it to the machine, the feeding members being so arranged that as one seizes an article another delivers an article, a suction passage in said column, a sleeve valve arranged concentrically with said column between said column and said transfer member, means for reciprocating the sleeve valve on said column for controlling the application of suction to said feeding members, means for moving said transfer member alternately in opposite axial directions so as firstly to move it into seizing and delivering position and then to lift it clear of the source of supply and the machine, and means for rotating said transfer member after the seizing of each article to effect the transfer.

2. A device according to claim 1, comprising a Geneva mechanism for rotating the transfer member, the Geneva mechanism including a slotted member secured to the transfer member for axial movement therewith and being of such dimensions as to allow the axial movement of the transfer member while maintaining engagement between the two members of the Geneva mechanism.

3. A machine for wrapping razor blades or like articles, comprising a cylindrical supporting column, an intermittently rotatable suction transfer member rotatably mounted on said column and slidable thereon in axial directions, said transfer member being formed with at least two feeding members provided with suction passages and each adapted in turn to seize an article by suction contact with its upper surface and transfer it to the machine, the feeding members being so arranged that as one seizes an article another delivers an article, a suction passage in said column, a sleeve valve arranged concentrically with said column between said column and said transfer member, means for reciprocating the sleeve valve on said column for controlling application of suction to said feeding members, means for moving said transfer member alternately in opposite axial directions so as firstly to move it into seizing and delivering position and then to lift it clear of the source of supply and the machine, means for rotating said transfer member after the seizing of each article to transfer the article to a pocket of a movable pocketed member to which a wrapper has been previously applied, means for folding the wrapper about the article to form a wrapped package, and a detecting mechanism operable

at a detecting station between the seizing and transfer stations to detect the absence of a blade from said feeding member and upon such detection to operate a delayed action mechanism for removing from the pocket of the pocketed member at a later stage the empty package resulting from the failure of the feeding member to transfer a blade to the pocket.

4. A machine according to claim 3, comprising a Geneva mechanism for rotating the transfer member, the Geneva mechanism including a slotted member secured to the transfer member for axial movement therewith and being of such dimensions as to allow the axial movement of the transfer member while maintaining engagement between the two members of the Geneva mechanism.

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