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TITLE: Hand Labelling Machine

Technical Field

The present invention relates to a hand labelling machine of the type used for printing labels and price tags for application to goods.

Background Art

Conventional hand labelling machines are known to consist of a hand gripper, print head, feeder, and label dispenser. When the hand gripper and lever component are squeezed together, the print head prints indicia on the label which is on a label strip. By releasing the gripper, the label strip is advanced and this exposes the printed label. The feeder is for the purpose of advancing the label strip, while label dispenser comprising a platen is for releasing the label materials.

Sometimes the inconsistent travelling distance of the label strip causes inaccuracy in dispensing the label material. If the strip overshoots, the label material will drop out from the tip of the label dispenser. On the other hand, the backward movement of the strip will leave insufficient contact surface to be applied on the work piece.

In addition, hand labelling machines are subject to wear. This is especially the case where certain components of the machine are formed of flexible material such as the flexible ratchet pawls of the machine disclosed in GB patent 1575216. This leads to frequent repair of the machine if it is in heavy use.

Furthermore, prior art hand labelling machines also suffer from the disadvantage that the label strip is often difficult to thread through, making threading a difficult and time consuming task. In addition, prior art hand labelling machines also have complex mechanisms for supporting the label strip as it passes through the



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passageway. For example GB Patent 1581769 has a complex sliding four bar mechanism which connects the platen and label support to create a passageway when the machine is being threaded. The complex nature of this mechanism makes
5 manufacture expensive because of the number of parts.

Summary of Invention

It is an object of the present invention to provide a hand labelling machine with better accuracy and reliability.

10 It is also an object of the present invention to provide a hand labelling machine in which it is simple to load the strip by providing greater access to the strip passageway through the machine.

In a first aspect the invention provides a hand
15 operated labelling machine comprising printing means for printing indicia on labels, a label passageway through the machine which allows labels on a strip to move towards, and past, said printing means, a feeding means for moving a label strip through the machine, and an actuating means
20 which operates said feeding means, wherein said feeding means comprises a feed wheel which is rotatably mounted on said machine comprising label strip engaging elements to engage and advance said labels and a driving wheel coaxial with said feed wheel which is able to drive said feed
25 wheel, wherein, when said driving wheel rotates in a first direction, it rotates said feed wheel in said first direction to advance said strip, and wherein said driving wheel is able to rotate in a second direction without rotating said feed wheel, the improvement comprising a stop
30 means comprising inter-engaging members which allow movement of the feed wheel in said first direction and prevents movement in said second direction wherein said inter-engaging members are located on the external periphery of said feed wheel.

35 In a second aspect the invention provides a hand

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operated labelling machine comprising printing means for printing indicia on labels, a label passageway through the machine which allows labels on a strip to move towards, and past, said printing means, a feeding means for moving a label strip through the machine, and an actuating means which operates said feeding means, wherein said feeding means comprises a feed wheel rotatably mounted on said machine comprising a label strip engaging means to engage and advance said label strip and a driving wheel coaxial with said feed wheel which is able to drive said feed wheel, wherein, when said driving wheel rotates in a first direction it rotates said feed wheel in said first direction to advance said strip, and wherein said driving wheel is able to rotate in a second direction without rotating said feed wheel, the improvement comprising rigid projections on said driving wheel which engage with drive members on said feed wheel, said rigid projections oriented such that movement of the driving wheel in said first direction causes said projections to engage said drive members and movement in said second direction causes said projections to slide over said drive members, wherein a biasing means is provided which laterally biases one from said driving wheel or feed wheel towards the other of said driving wheel or feed wheel.

In a third aspect the invention provides a hand operated labelling machine comprising printing means for printing indicia on labels, a label passageway through the machine which allows labels on a strip to move towards, and past, said printing means, a feeding means for moving a label strip through the machine, and an actuating means which operates said feeding means, wherein said feeding means comprises a feed wheel which is rotatably mounted on said machine comprising label strip engaging elements to engage and advance said labels and a driving wheel coaxial with said feed wheel which is able to drive said feed wheel, wherein, when said driving wheel rotates in a first

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direction, it rotates said feed wheel in said first direction to advance said strip, and wherein said driving wheel is able to rotate in a second direction without rotating said feed wheel, wherein said machine also
5 comprises a movable platen with a surface for the strip to travel along and a label support which assists in guiding the strip along said surface, wherein the platen is movable into an operative position and an inoperative position, and wherein the label support is movable into an operative and
10 an inoperative position, the improvement comprising, the provision of a wider space for fitting the strip by the platen and the label support being independently movable relative to each other, into their inoperative positions, and the label support being biased for movement into its
15 inoperative position.

Brief Description of the Drawings

One embodiment of the invention will now be described with reference to the following non-limiting drawings.

20 Figure 1 is a sectional view of the machine in loaded closed state.

Figure 2 is a sectional view of the machine in unloaded open state.

25 Figure 3a is a back sectional view with a feed wheel locking cam.

Figure 3b is a front sectional view showing ratcheted driving components.

Figure 4 is an exploded view of the feed wheel assembly.

30 Figure 5 is an exploded view of the feed wheel assembly seen from the other view angle.

Detailed Description of the Preferred Embodiments

The machine may be in closed state as shown in

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Fig. 1 or an open state as seen in Fig. 2.

The machine comprises lever 1 with a gripping portion 1a at a first end and print head 8 at the other end. Lever 1 is pivotally secured to handle 2 at shaft 3. Spring 4 is in a pre-loaded state between lever 1 and handle 2. The actuating means comprises lever 1, handle 2 and spring 4. The machine also comprises a frame or casing (not shown).

Print head 8 sits above ink roller 9 which is pivotally secured at shaft 10. Ink roller 9 is mounted such that as inking of print head 8 is completed, ink roller 9 pivots away from print head 8, when print head 8 moves downwards as lever 1 is pulled up. The printing means comprises print head 8 and ink roller 9.

Labels on a label strip are present on a roll A mounted at the top of the machine. Strip 11 passes into the machine via label track 13 where it passes between label support 14 and feed wheel 5 in the open position as shown in Fig. 2. The machine is placed in the closed position (see Fig. 1) by rotating platen 17 clockwise and shutting bottom cover 12 which also pushes label support 14 in a clockwise direction. In the closed position strip A passes between label support 14 and feed wheel 5 and platen 17. It follows the contours of platen 17 passing over tip 17a to the underside thereof, then contacting another surface of feed wheel 6, and passing out of the machine close to lever 1.

Labels are disengaged from the strip as they pass over tip 17a of the platen 17.

In its open state the machine provides a wide label passageway 15 for the strip 11 as seen in Fig. 2. When cover 12 which is pivotally mounted on the machine is released it hangs down and platen 17 which is pivotally mounted on driving wheel 5 rotates in an anti-clockwise direction. Label support 14 rotates in an anti-clockwise direction by means of spring 16 close to tip 14a. The

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advantage of the invention is that both platen 17 and label support 14 can move independently of each other, unlike in the prior art where a linkage mechanism links these members and is complex and difficult to manufacture. The

5 independent nature of the movement of these two members means that the label passageway 15 may be opened wider at various points, as necessary during the threading process. In addition the invention provides that the machine will automatically open for threading. When cover 12 is
10 released, pre-loaded spring 16 rotates label support 14 in an anti-clockwise direction which results in platen 17 automatically adopting an open position because it is pushed by tip 14a. This is distinct from the prior art machine which must be opened manually.

15 The feeding means comprises driving wheel 5 and feed wheel 6. Driving wheel 5 is able to engage with feed wheel 6 and rotate feed wheel 6 in one direction but move independently of feed wheel 6 in a second direction.

Driving wheel 5 is basically cylindrical with a
20 central bore 5a with a disc-like member 5b on one side. Gear teeth 5c are radially disposed part way round driving wheel 5. These are designed to engage with driving teeth 7 on lever 1. Driving wheel 5 has a recess 5d at the other side in which biasing means 26 in the form of spring 26a
25 sits. Rigid projections 25 on disc-like member 5b are in the form of ramps 25a disposed on the face of driving wheel 5 which contacts feed wheel 6 and are oriented such that when driving wheel 5 is moved in one direction the ramps engage feed wheel 6 and when moved in a second direction
30 they do not engage the feed wheel 6. Spring 26a urges driving wheel 5 towards said feed wheel.

Feed wheel 6 comprises a central bore 6a with
drive members 30 on one side in the form of radial walls 30a extending from the central bore. On the other side of
35 driving wheel 6 are recesses 24 which are disposed towards the outer periphery of the wheel. Label strip engaging

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means 18 in the form of pins 18a are disposed around the outer edge of feed wheel 6. Pins 18a are located on the circumference of feed wheel 6 such that they correspond to the position of radial walls 30a. This is so that the travel distance of feed wheel 6, which is dependent on the distance between each pin (pitch), consistently advances each label on the strip.

Thus, driving wheel 5 and feed wheel 6 together form a ratchet mechanism.

In use driving wheel 5 is urged laterally towards feed wheel 6 by biasing means in the form of spring 26. Ramps 25a engage with radial walls 30a of feed wheel 6 when driving wheel 5 is moved in a first direction (in this case when driving wheel 5 is moved anti-clockwise) which advances the strip. Ramps 25a "snap" into place adjacent to radial walls 30a. When driving wheel 5 is moved in the other direction (clockwise) ramps 25a slide over radial walls 30a because driving wheel 5 is able to move in a lateral direction away from feed wheel 6. Driving wheel 5 is pushed back into place by spring 26.

Backward movement of feed wheel 6 is prevented by stop means in the form of pawl or catch 23 comprising a cam 23a in the form of boss 23b which engages recesses 24 disposed around the outer or external periphery of feed wheel 6. Thus pawl or catch and recesses 24 form inter-engaging members. Pawl or catch 23 is pivotally secured to the casing (or frame) by pin 20 which extends from the casing and by virtue of its arcuate shape is biased towards feed wheel 6. Pawl or catch 23 acts as a pre-loading spring.

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THE CLAIMS DESCRIBING THE INVENTION ARE AS FOLLOWS

1. A hand operated labelling machine comprising printing means (8, 9) for printing indicia on labels, a label passageway (15) through the machine which allows
5 labels on a strip (11) to move towards, and past, said printing means (8, 9), a feeding means (5, 6) for moving a label strip through the machine, and an actuating means (1, 2 & 4) which operates said feeding means (5, 6), wherein said feeding means (5, 6) comprises a feed wheel (6) which
10 is rotatably mounted on said machine comprising label strip engaging elements (18) to engage and advance said labels and a driving wheel (5) coaxial with said feed wheel (6) which is able to drive said feed wheel (6), wherein, when said driving wheel (5) rotates in a first direction, it
15 rotates said feed wheel (6) in said first direction to advance said strip, and wherein said driving wheel (5) is able to rotate in a second direction without rotating said feed wheel (6), the improvement comprising a stop means (23, 24) which prevents rotation of said feed wheel (6) in
20 said second direction, said stop means comprising inter-engaging members (23, 24) which allow movement of the feed wheel (6) in said first direction and prevents movement in said second direction wherein said inter-engaging members (23, 24) are located on the external periphery of said feed
25 wheel (6).

2. The machine according to claim 1 wherein the inter-engaging members comprise recesses (24) on the feed wheel (6) and a boss (23a) on a pawl or catch (23).

3. A hand operated labelling machine comprising
30 printing means (8, 9) for printing indicia on labels, a label passageway (15) through the machine which allows labels on a strip (11) to move towards, and past, said printing means (8, 9), a feeding means (5, 6) for moving a label strip through the machine, and an actuating means (1, 2 & 4) which operates said feeding means (5, 6), wherein
35 said feeding means (5, 6) comprises a feed wheel (6)

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rotatably mounted on said machine comprising a label strip engaging means (18) to engage and advance said label strip (11) and a driving wheel (5) coaxial with said feed wheel (6) which is able to drive said feed wheel (6), wherein, when said driving wheel (5) rotates in a first direction it rotates said feed wheel (6) in said first direction to advance said strip (11), and wherein said driving wheel (5) is able to rotate in a second direction without rotating said feed wheel (6), the improvement comprising rigid projections (25) on said driving wheel (5) which engage with drive members (30) on said feed wheel (6), said rigid projections (25) oriented such that movement of the driving wheel (5) in said first direction causes said projections (25) to engage said drive members (30) and movement in said second direction causes said projections (25) to slide over said drive members (30), wherein a biasing means (26) is provided which laterally biases one from said driving wheel (5) or feed wheel (6) towards the other of said driving wheel (5) or feed wheel (6).

4. The machine according to claim 3 wherein said rigid projections comprise ramps (25a).

5. The machine according to claim 4 wherein the drive members comprise radial walls extending from a central axis of said feed wheel.

6. The machine according to claim 5 wherein label strip engaging means (18) comprise projections (18a) on an outer surface of said feed wheel in spaced relationship with said radial walls (30a) such that the strip is advanced a predetermined length with each operation of the actuating means (1, 2 & 4).

7. The machine according to claim 3 wherein biasing means (26) is a spring (26a) which urges said driving wheel towards said feed wheel.

8. A hand operated labelling machine comprising printing means (8, 9) for printing indicia on labels, a label passageway (15) through the machine which allows

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- labels on a strip (11) to move towards, and past, said printing means (8, 9), a feeding means (5, 6) for moving a label strip through the machine, and an actuating means (1, 2 & 4) which operates said feeding means (5, 6), wherein said feeding means (5, 6) comprises a feed wheel (6) which is rotatably mounted on said machine comprising label strip engaging elements (18) to engage and advance said labels and a driving wheel (5) coaxial with said feed wheel (6) which is able to drive said feed wheel (6), wherein, when said driving wheel (5) rotates in a first direction, it rotates said feed wheel (5) in said first direction to advance said strip, and wherein said driving wheel (5) is able to rotate in a second direction without rotating said feed wheel (6), wherein said machine also comprises a movable platen (17) with a surface for the strip to travel along and a label support (14) which assists in guiding the strip along said surface, wherein the platen (17) is movable into an operative position and an inoperative position, the improvement comprising, the provision of a wider space for fitting the strip (11) by the platen (17) and the label support (14) being independently movable relative to each other, into their inoperative positions, and the label support (14) being biased for movement into its inoperative position.
9. The machine according to claim 8 wherein said platen (17) and label support (14) move in the same direction to reach their inoperative positions.
10. The machine according to claim 9 wherein said bias is provided by a spring (16) on said label support.
11. A hand operated labelling machine comprising the features of claims 1, 3 and 8.