

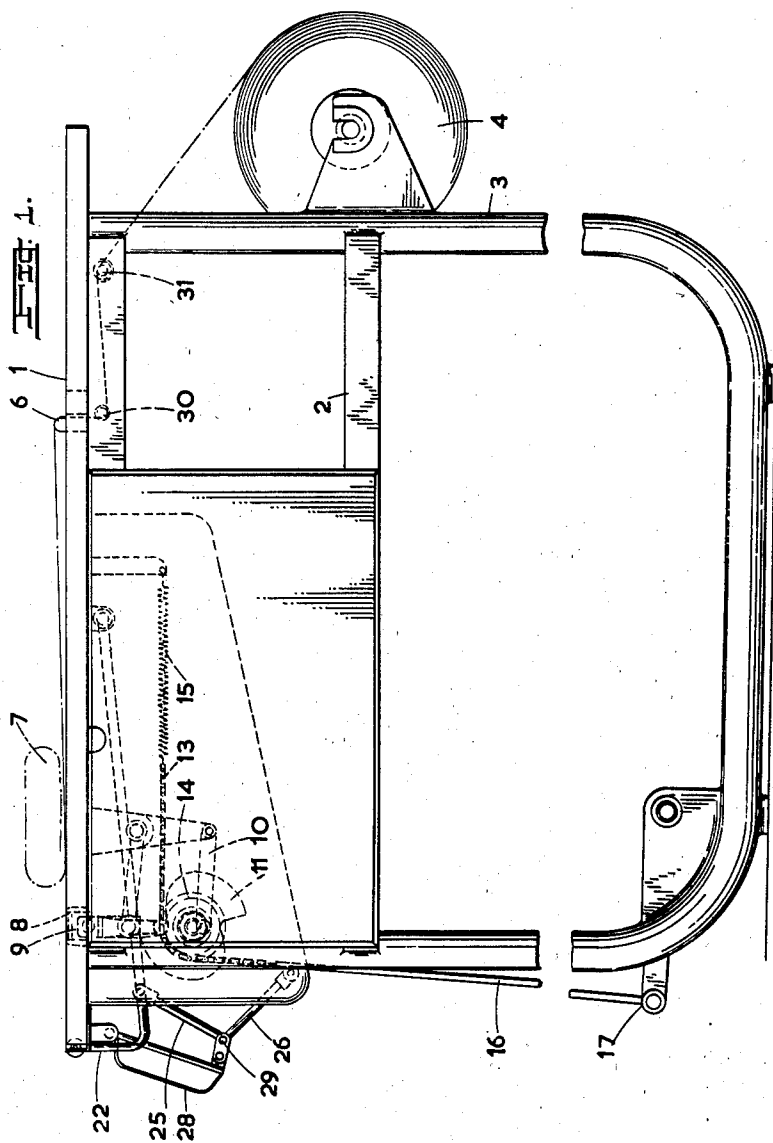
July 15, 1958

J. A. REED
WRAPPING OF OBJECTS OR GOODS IN
THERMOPLASTIC SHEET MATERIAL

2,842,910

Filed Dec. 6, 1954

3 Sheets-Sheet 1



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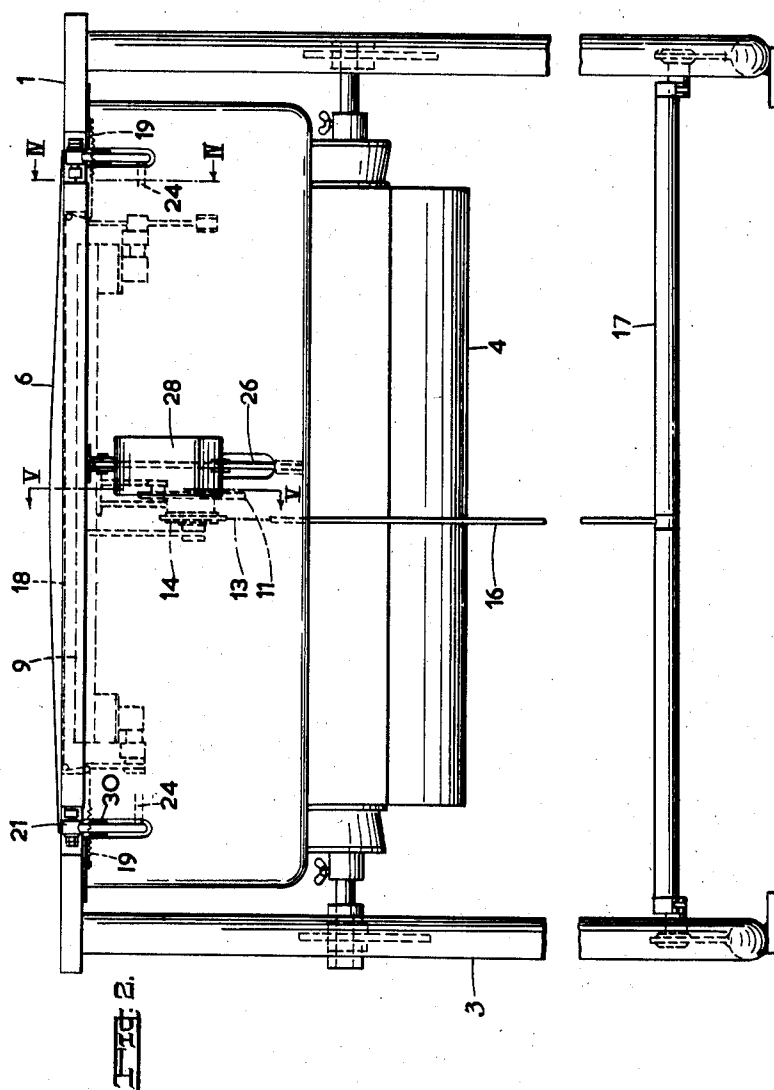
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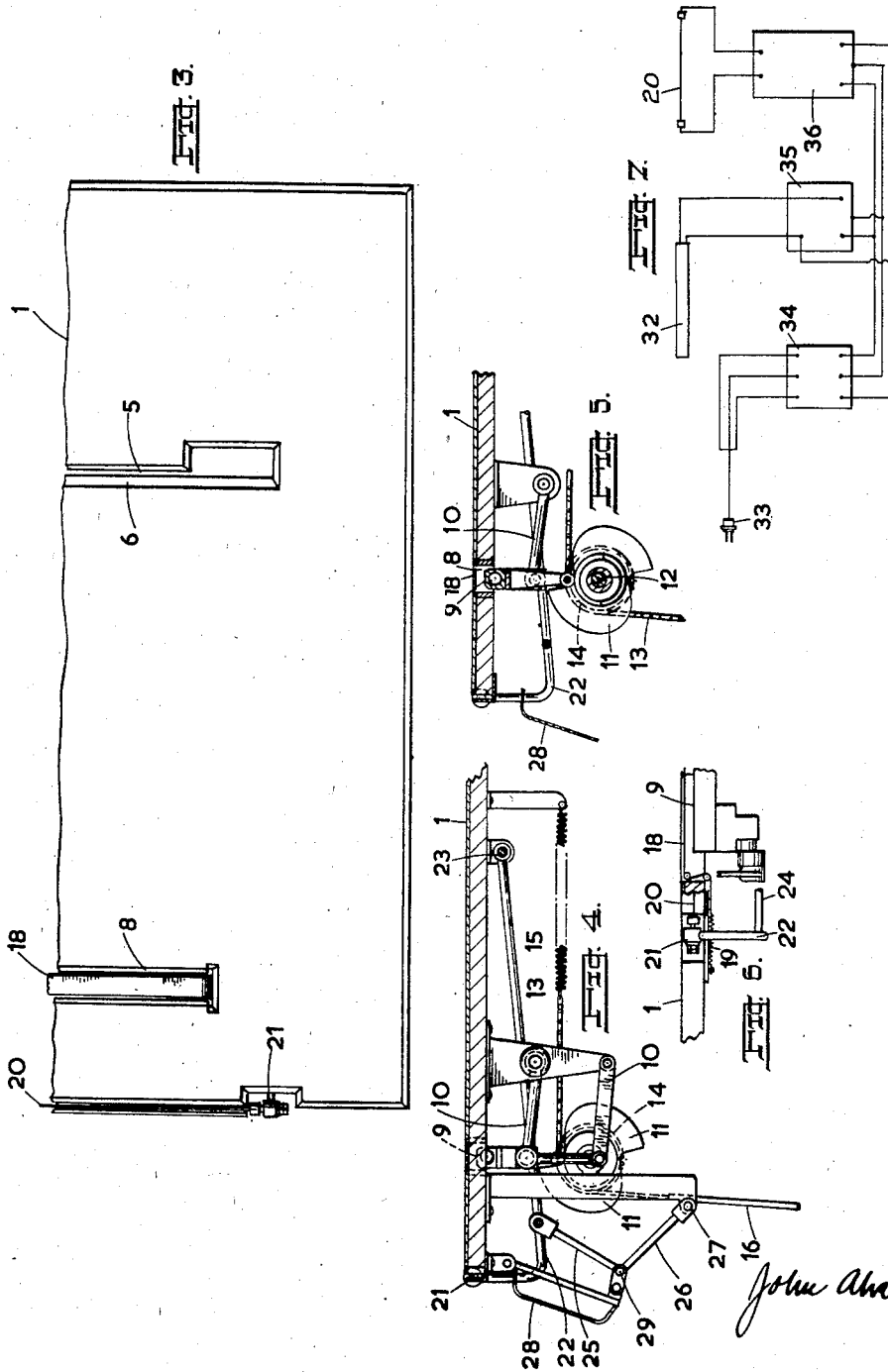
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WRAPPING OF OBJECTS OR GOODS IN THERMO-PLASTIC SHEET MATERIAL

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16 Claims. (Cl. 53—33)

The present invention relates to the wrapping of objects or goods with wrapping material in the form of thermoplastic sheet such for example as polyethylene sheet.

According to one feature of the present invention the sheet is manually drawn lengthwise from a supply thereof along a platform towards an operator at one end of the platform, the object to be wrapped is placed upon the sheet and at least partly covered by the end portion of the sheet whereupon the object with the sheet in engagement therewith is inverted upon the platform by angular displacement in a direction away from the operator to form a loop of the sheet around the object and to overlap said end portion of the sheet with said intermediate portion thereof whereupon the overlapping portions are heat seamed in a direction across the platform. The said wrapping material engaging around the object is preferably severed from the supply, after the object has been removed from the platform, by the application of heat to the material along a line running across the material near the position at which it was seamed and of course on that side of the seam nearer the supply.

In a preferred mode of withdrawing the object from the platform it is angularly displaced in a direction towards the operator to bring the seam to that side of the object away from the operator and so that the wrapping material extending between the seam and the supply will extend away from the operator without passing around the object.

Another feature of the invention consists in an apparatus for facilitating the wrapping of objects in thermoplastic sheet wrapping material which comprises a platform or bench along which the sheet can be drawn and on which the sheet can be folded in the form of a loop around an object to be wrapped, a seaming bar adapted to be heated to seaming temperature and capable of being raised and lowered relatively to the platform for the purpose of heat seaming a loop of sheet wrapped around the object and a knife or wire adapted to be heated to a temperature appropriate for severing the sheet when applied thereto and capable of being raised and lowered relatively to the platform.

A further feature of the invention consists in an apparatus for facilitating the wrapping of goods in thermoplastic sheet material from a supply thereof in which a wire running substantially transversely of a wrapping platform just beyond one end thereof is adapted to be electrically heated to a temperature suitable for the cutting or severance of the thermoplastic sheet when brought into engagement therewith and is provided with means for raising it up to an operative position and lowering it to an inoperative position beneath the level of the platform whilst a bar, also running substantially transversely of the platform and roughly within arms length of said wire, is adapted to be heated to a temperature appropriate for seaming together layers of the thermoplastic sheet and is provided with means for raising it to an operative position and lowering to an in-

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operative position below the level of the platform whereby goods can be wrapped by placing them on a length of thermoplastic material drawn from the supply thereof and lying on the platform, engaging the sheet around the goods, inverting the goods to overlap the sheet and bringing the sheet so overlapped above said bar which can then be raised to form a seam across the overlapping sheet which can subsequently be severed from the supply thereof on that side of the seam nearer the supply.

According to another aspect of the invention an apparatus for facilitating the wrapping of goods in thermoplastic sheet material comprises a platform or bench, a wire running transversely across one end of the platform, means for raising the wire to an operative position from an inoperative position below the level of the platform, means for heating the wire sufficiently to enable it to sever the sheet when in engagement therewith, and an approximately transverse slot in or through the platform roughly within arms length of the aforesaid end thereof, a seaming bar adapted to be raised in or into said slot and means for heating the bar to a temperature suitable for seaming together when the bar is raised layers of the wrapping material on the platform.

The wire should be capable of being raised to a level a little above the level of the platform or bench.

The said slot may be open at the level of the platform in which case the bar should be capable of being raised to a level a little above the level of the platform.

The said slot may however be closed substantially at the level of the platform by means of a strip or ribbon of heat conducting but heat resisting material of a character such that it will not when hot stick to the thermoplastic material. In this case the bar should be capable of being raised into contact with the underside of said strip to elevate the strip to a level a little above the level of the platform to enable heat from the bar to be transmitted through the strip to the thermoplastic wrapping material. Said strip may be of flexible material and may be mounted on the platform so as to be capable of a limited degree of upward movement when the bar is pressed against the underside thereof.

Said strip may be mounted in the said slot and may for example be fixed at one end of the slot and spring loaded at the other end to enable the bar to press it properly into engagement with the thermoplastic material to be seamed.

The said strip may consist of a fluorine-containing plastic material such as polytetrafluoroethylene or may consist of a suitable fabric coated with polytetrafluoroethylene, or again a silicone coated fabric may be used.

It is contemplated that instead of using a strip of material in or above the slot it may be satisfactory to coat the bar itself with polytetrafluoroethylene or with a silicone resin for the purpose of preventing it from sticking to the thermoplastic material. It may be preferable however to use a strip mounted on the platform whereby to enable the strip to cool when the bar moves from engagement therewith.

The invention is further described by way of example with reference to the accompanying drawings, in which:

Fig. 1 is a side view;

Fig. 2 is a corresponding end view;

Fig. 3 is a fragmentary plan view of the bench or platform;

Figs. 4 and 5 are fragmentary sectional details viewed on the lines IV—IV and V—V respectively of Fig. 2;

Fig. 6 is a fragment in section of the end view shown in Fig. 2, and

Fig. 7 is a wiring diagram.

Referring to the drawings a flat platform or bench 1 is mounted on a support consisting of L-angle 2 and tubular framing 3. The framing 3 is provided at one

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end with suitable brackets for the support of a roll of thermoplastic sheet material 4.

The sheet material 4 passes from the roll through a transverse slot 5 in the platform 1 and over a stretcher or fishback 6 which is of upwardly convex shape and of smooth contour and tends to remove wrinkles or creases from the sheet material 4. An operator stands at the left-hand end of the platform 1 as viewed in Fig. 1 and in order to wrap an object 7, which may consist for example of a quantity of textile material, places the object on the thermoplastic sheet of material at a position spaced from the end of the sheet material and then wraps the end of the sheet material forwardly, i. e. away from himself, onto the top of the object. The operator thereupon inverts the object with the wrapping material in engagement therewith by angular displacement in a direction away from himself, i. e. in a clockwise direction as viewed in Fig. 1, and brings the object so wrapped to a position above a slot 8 in the platform with a double thickness of the thermoplastic material above the slot.

An electrically heated metal bar 9 is mounted in the slot and can be moved upwardly from an inoperative position below the level of the platform in order to apply heat to the thermoplastic wrapping material to form a seam thereacross. The bar 9 is supported by a linkage 10 of parallelogram form so that it can be raised and lowered more or less vertically. The bar is raised and lowered by a cam 11 rotatable about an axis 12 by means of a chain 13 and sprocket 14, the chain being connected at its righthand end to a spring 15 and at its lower end to a rod 16 connected to a foot operated treadle 17. The cam has two crowns which come into operation alternately and each crown consists of a rising portion which merges into a circular portion and terminates in a substantially radial falling portion from which the rising portion of the second crown commences. Thus on rotation of the cam 11 by the treadle 17 the bar 9 will be raised to its operative position by the first and rising part of one of the crowns and then held in its operative position by the second and circular part of the crown and finally allowed to return to its inoperative position by the falling part of the crown, each movement of the cam 11 to cause the bar 9 to rise to its operative position and return to its inoperative position being effected by a single downward movement of the treadle 17.

In the arrangement shown in the drawings the slot 8 is closed at the top by a strip 18 of heat conducting, heat resisting material which is of such a character or is so coated that it will not stick to the thermoplastic wrapping material during the seaming thereof. The strip 18 is resiliently mounted in the slot 8 (Figs. 2 and 6) and at each end is connected to a spring 19 which tends to draw it downwardly to the level of the platform 1 but which allows it to rise when the bar 9 is pressed upwardly into engagement with its underside to transmit heat through the strip 18 to the wrapping material to form a seam.

After the seam has been formed the wrapped object 7 is drawn by the operator to the lefthand end of the platform as viewed in Fig. 1 and is angularly displaced through approximately 90° in a direction towards the operator i. e. in a counter clockwise direction as viewed in Fig. 1 and the thermoplastic material wrapped around the object 7 is severed from the supply in a direction approximately at rightangles to the length thereof and at a position near the seam by bringing the wrapping material into engagement with an electrically heated knife or wire 20 running between two chucks 21 mounted on arms 22 which are pivoted beneath the table at 23 (see Figs. 1, 4 and 6). Arms 22 have a bar 24 connected therebetween which approximately at its mid-width is pivoted to the upper end of a link 25 pivotally connected at its lower end to the upper end of a second

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link 26 which at its lower end is pivoted about a fixed pivot 27. A presser plate 28 is pivotally connected to the pivot 29 between the links 25 and 26 so that when the presser plate 28 is pushed to the right as viewed in Figs. 1 and 4, the pivot 29 will also move to the right to bring the links 25 and 26 more into line with one another and thus to raise the arms 22 and the wire 20.

The angular displacement of the wrapped object 7 and its withdrawal from the platform 1 may be carried out by drawing the object 7 to the end of the platform 1 and allowing the angular displacement to occur as the object descends over the edge of the platform into engagement with the presser plate 28.

It will be appreciated that when pressure on the presser plate 28 is relieved the arms 22 and the wire 20 will fall under the action of gravity to bring the wire into an inoperative position beneath the level of the platform 1.

The bar 9 will fall under the action of gravity to an inoperative position beneath the level of the platform 1 by continued rotation of the cam 11 beyond the positions at which it moves the bar 9 to its uppermost position. A ratchet connection is provided between the cam 11 and the sprocket 14.

Two transverse rollers 30, 31 (see Fig. 1) are arranged beneath the platform 1 for the guidance of the thermoplastic sheet 4 on its way to the slot 5. The roller 30 is arranged beneath the slot 5 and is slightly urged downwardly to apply a moderate amount of tension to the sheet material 4.

In the wiring diagram shown in Fig. 7 electrical energy is supplied from a plug 33 and master switch 34 to the cutting wire 20 and to a heating element 32 arranged in the bar 9. A thermostatic regulator 35 is interposed between the heating element 32 and the supply whilst a transformer 36 is interposed between the cutting wire 18 and the electric supply in order to reduce the voltage to say 12 volts.

I claim:

1. A method of wrapping an object with wrapping material in the form of thermoplastic sheet which comprises the steps of manually drawing the sheet lengthwise from a supply thereof along a platform towards an operator at one end of the platform, placing the object to be wrapped upon the sheet so as to be at least partly covered by the end portion of the sheet, inverting the object in engagement with the sheet by angular displacement in a direction away from the operator to form a loop of the sheet around the object and to overlap said end portion of the sheet with an intermediate portion thereof, heat seaming said overlapping portions together in a direction across the platform to maintain the loop, removing the object with the loop extending therearound from the platform, and subsequently severing the loop from the remainder of the sheet under tension, by the application of heat along a line across the sheet near the position at which it was seamed.

2. A method according to claim 1 in which the removal of the object from the platform includes angular displacement thereof in a direction towards the operator to bring the seam to that side of the object away from the operator so that the remainder of the sheet will extend from the seam in a direction away from the operator and without passing around the object.

3. An apparatus for facilitating the wrapping of objects in thermoplastic sheet wrapping material comprising a platform along which the sheet can be drawn and on which the sheet can be folded in the form of a loop around an object to be wrapped, a seaming bar, means for heating the bar to seaming temperature, means for raising the bar relatively to the platform for heat seaming a loop of sheet wrapped around the object, a knife transversely mounted below the platform beyond the seaming bar, means for heating the knife to a temperature appropriate for severing the sheet when applied

thereto and means for raising said knife above the platform.

4. An apparatus for facilitating the wrapping of goods in thermoplastic sheet material comprising a platform having a transverse slot therein roughly within arms length of one end thereof, a wire running transversely across said end of the platform, means for raising the wire to an operative position from an inoperative position below the level of the platform, means for heating the wire sufficiently to enable it to sever the sheet when in engagement therewith, a seaming bar in said slot, means for heating the bar to a temperature suitable for seaming together layers of the wrapping material on the platform when the bar is raised and means for raising and lowering the seaming bar in said slot operable independently of the means for raising and lowering said wire.

5. An apparatus for facilitating the wrapping of goods in thermoplastic sheet material drawn from a supply thereof comprising a wrapping platform, having a transverse opening therein moderately spaced from one end thereof, a wire running substantially transversely of said platform just beyond said end thereof, means for electrically heating said wire to a temperature suitable for severing the thermoplastic sheet when brought into engagement therewith, means for raising said wire up to an operative position and lowering it to an inoperative position beneath the level of the platform, a seaming bar aligned with said opening in the platform, means for heating said bar to a temperature appropriate for seaming together layers of the thermoplastic sheet, means for raising said bar relatively to said opening to an operative position and lowering to an inoperative position below the level of the platform, said last mentioned means being operable independently of the means for raising said wire.

6. Apparatus according to claim 4 in which said means for raising the severing wire is adapted to raise the wire to an operative position a little above the level of the platform.

7. Apparatus according to claim 4 in which the said slot is open at the level of the platform and the said means for raising the seaming bar is adapted to raise the bar to a level a little above the level of the platform.

8. Apparatus according to claim 4 in which the said slot is closed substantially at the level of the platform by means of a strip of heat conducting but heat resisting material of a character such that it will not when hot stick to the thermoplastic material, whilst said means for raising the seaming bar is adapted to raise the bar to an operative position in contact with the underside of said strip to elevate the strip to a level a little above the

level of the platform to enable the heat from the bar to be transmitted through the strip to the thermoplastic sheet.

9. Apparatus according to claim 8 in which said strip is fixedly mounted to one end of the slot and spring loaded at the other end of the slot to enable the bar to press it properly into engagement with the thermoplastic sheet to be seamed.

10. Apparatus according to claim 8 in which the strip consists of a fluorine-containing plastic material such as polytetrafluoroethylene or a fabric coated with polytetrafluoroethylene or a silicone coated fabric.

11. Apparatus according to claim 7 in which the seaming face of the bar is coated with a suitable substance to prevent it from sticking to the thermoplastic sheet, such for example as with polytetrafluoroethylene or a silicone resin.

12. Apparatus according to claim 4 comprising means for supporting a roll of the thermoplastic sheet near one end of the platform which has a transverse slot therein through which the sheet is passed on its way to the wrapping position.

13. Apparatus according to claim 12 comprising a stretcher of smooth contour and of upwardly convex shape arranged along the edge of the said slot nearer the wrapping position with the object of smoothing out the sheet material and in conjunction with the passage of the sheet material through the slot, to apply a moderate degree of resistance to movement of the sheet towards the wrapping position.

14. Apparatus according to claim 4 comprising a linkage of parallelogram form for supporting the seaming bar and a foot operated treadle for actuating said linkage to raise the seaming bar.

15. Apparatus according to claim 4 in which the severing wire or knife is moved upwardly by means of a suitable linkage actuated by a presser plate beneath the end of the platform at which the severing wire or knife is located so that the wrapped object on being withdrawn from the platform can readily be brought into engagement with the presser plate to raise the wire or knife.

16. Apparatus according to claim 3 in which said knife comprises a wire.

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