Oct. 13, 1959 E. KLEMM 2,908,132

DEVICE FOR LAYING FENCING MATERIAL

Filed Nov. 9, 1953

2 Sheets-Sheet 1

FIG. 2

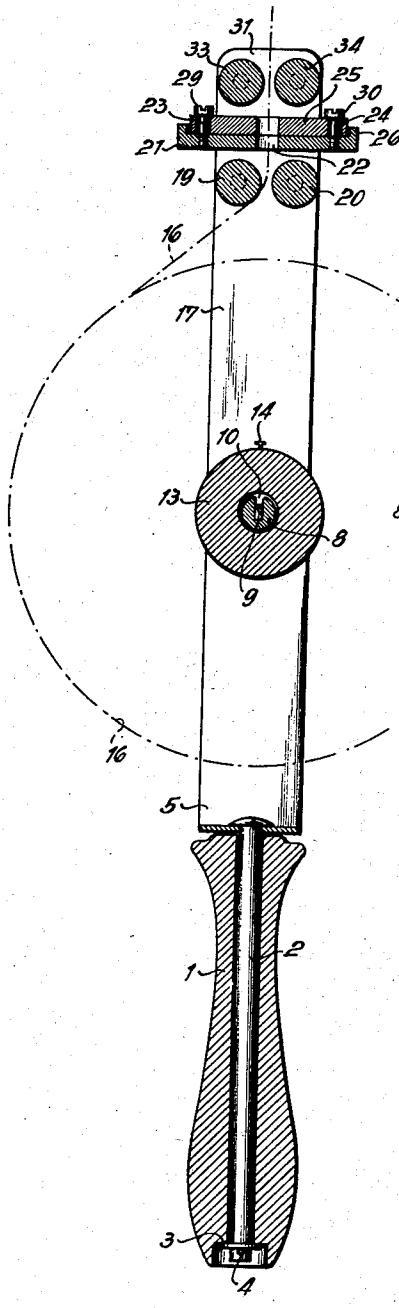


FIG. 1

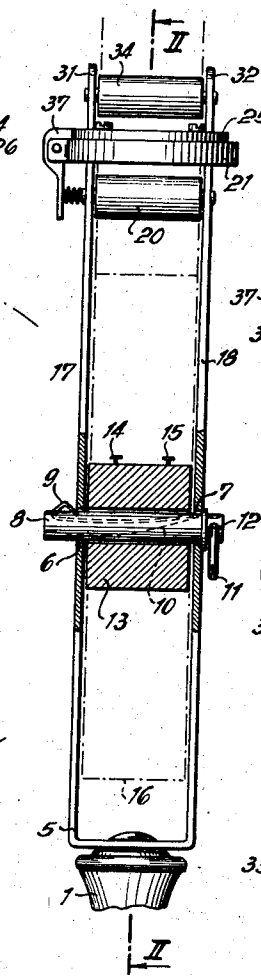


FIG. 3

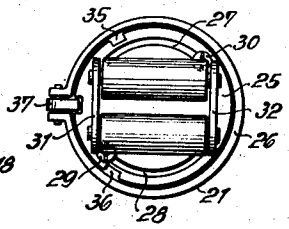


FIG. 4

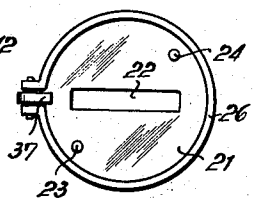


FIG. 5

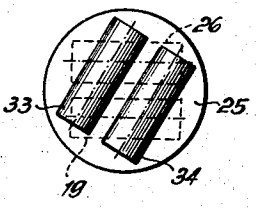
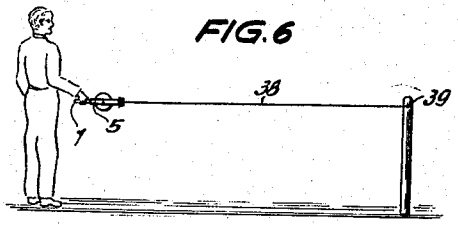


FIG. 6



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FIG. 7



FIG. 8

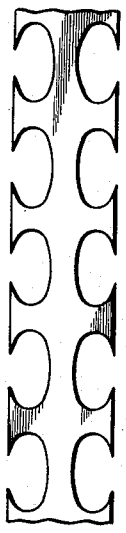


FIG. 9

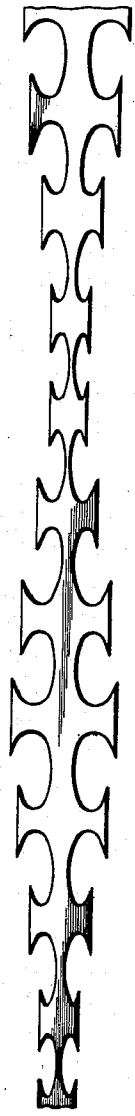


FIG. 10

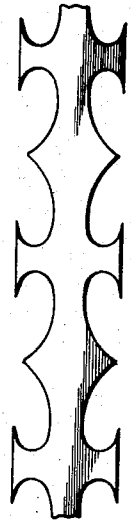
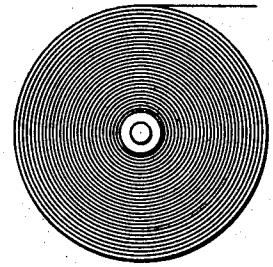


FIG. 11



FIG. 12



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United States Patent Office 2,908,132 Patented Oct. 13, 1959

2,908,132

DEVICE FOR LAYING FENCING MATERIAL

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Application November 9, 1953, Serial No. 391,073

Claims priority, application Germany January 12, 1952

10 Claims. (Cl. 57—1)

The invention relates to a method of laying strip fencing material provided with lateral spikes or teeth.

According to the invention it is proposed to wind the fencing material, which, together with its spikes, is flattened out in a plane, in the form of a delivery spool, and, after securing its free end to a stationary object, for example a wall, a tree or a post, to draw it progressively from the spool in such a manner that, in addition to the rotation of the roll of strip about its spool spindle, caused by the withdrawal of the strip, a rotation about a spindle running at right angles to this spool spindle, for example about a spindle lying in the direction of withdrawal, is positively effected by the tension exerted on the strip.

In this way, the strip which is laid across the country, is twisted about its longitudinal axis so that the lateral spikes or teeth of the strip now project in all directions. In this manner the strip can achieve a particularly good deterrent and defensive effect, particularly if the lateral portions are not only spiked but are also made as cutting edges, so that in this respect it is superior to barbed wire constructed and used in the conventional manner. To this must be added the greater strength of such a strip fencing material twisted about its longitudinal axis, and the possibility of producing it particularly easily by machine.

The said second rotation of the spool, together with the spool carrier, about the spindle of the pulled strip can be effected during the progressive withdrawal of the strip by the fact that at the delivery point, the strip is conveyed from the spool carrier through guides which give it a positive twist so that the elastic reaction of the strip, which may consist of steel for example, at this point, sets the spool carrier in rotation.

The second rotation of the spool and the spool carrier can also be imparted thereto by the fact that the friction of the strip running out is used to produce the said rotational movement by means of any desired transmission members. The rotation of the spool carrier may also be transmitted to the spool carrier from the likewise rotating spool spindle of the spool carrier by means of any desired transmission members. The extent of the twisting of the strip running out can be varied by adjusting the parts causing the second rotation of the spool carrier.

The invention further relates to a device for carrying out the said method of laying strip fencing material which is provided with lateral spikes or teeth.

This device consists of a frame to which is connected a carrier receiving the supply of strip in its smooth, flat form. The carrier is arranged to rotate both about the spool spindle and also about a spindle at right angles to the spool spindle, lying particularly in the direction in which the strip is unwound. There is also connected to the carrier a device which rotates it about the last-mentioned spindle as the strip is progressively unwound.

The frame taking the spool carrier may be made portable or mobile.

The portable frame is preferably provided with a handle by which it can be held while the strip is being withdrawn, or it can be made entirely in the shape of a handle, in which are mounted both the spool spindle and the spindle at right angles to the spool spindle.

The device effecting the rotation of the strip carrier and the said second spindle may, for example, consist of a guiding device mounted at the delivery end of the spool carrier and twisting the strip as it runs through. Said device may, for example, be constructed in the form of fixed guide surfaces or pairs of rollers with rotating rollers between which the strip runs.

The invention further relates to the formation of a fencing strip with marginal teeth, marginal hooks or marginal spikes, which is suitable for winding in the form of a spool on the device according to the invention, and which can be progressively withdrawn from the spool carrier, while being twisted about its longitudinal axis.

According to the invention, the fencing strip is provided along its longitudinal edges with a row of notches which are made open on the outside, so that on each of the marginal portions of the strip left between the two notches, two teeth are produced, facing in opposite directions. The notches at the edges of the strip may conveniently be given rounded contours, for example oval.

Other characteristics of the device according to the invention, for laying a fencing strip, together with further embodiments of the fencing strip itself, are illustrated in detail in the accompanying drawings.

In the accompanying drawing one embodiment of a device for carrying out the method of the invention is shown by way of example.

Figure 1 shows the device from the side, partly in section.

Figure 2 is a section along the line II—II in Figure 1.

Figure 3 is a plan view of the top of the device.

Figure 4 is a plan view of the device with the top removed.

Figure 5 shows diagrammatically the top portion of the device with the upper plate twisted round.

Figure 6 shows diagrammatically the process of twisting the strip.

Figure 7 to 10 show different embodiments of a toothed strip made according to the invention.

Figure 11 shows an approximately lenticular cross-section of the strip.

Figure 12 shows such a toothed strip wound up in the form of a flat spool.

In detail, the reference numeral **1** in the figures refers to the handle of the device, made for example of wood, plastic, metal or the like. This handle is bored through lengthwise. A spindle **2** is mounted for rotation in the bore, with its rear end secured to the handle **1** by means of a disc **3** and a pin **4**, or by similar means. At its front end, the spindle **2** carries a forked holder **5**, which may consist, for example, of sheet metal or the like. A spindle **8** is mounted on this holder **5** in the bores **6**, **7**, being secured against falling out by means of a spring **9** fitted in a groove **10**. To facilitate handling, the spindle **8** is provided at one end with a ring **11**, which is articulated to the spindle **8** at **12**. The spool, with the fencing strip wound thereon, is mounted for rotation on the spindle **8**, which may be mounted to rotate freely or be fixed in the holder **5**. The spool may, for example, consist of a metal or wooden core **13**, which may conveniently be provided with two pins or other projections **14**, **15**, in which the fencing strip is hooked during winding, by means of its hooked projections. Any desired length and thickness of fencing strip **16** may be wound on the core **13**.

The spool **16** is thus mounted in such a manner as to

be able to rotate about two spindles, once about the spool spindle 8, and again about the spindle 2, which is mounted for rotation in the handle 1.

At the front end of the two arms 17 and 18 of the forked holder 5, a guide device for the strip which is running out is provided which serves to delay the strip as it runs out, and set the spool 16 in rotation about the spindle 2. For this purpose a pair of rollers 19, 20 is mounted between the arms 17, 18, the rollers of which are spaced so as to provide a certain amount of play in relation to the thickness of the strip. In front of the pair of rollers 19, 20 there is provided a plate 21 which is fixed to the arms 17, 18 of the holder 5. This plate is provided with a slot 22 which is somewhat wider than the cross-section of the strip, and equipped with two upwardly projecting pins 23 and 24, for example lying diametrically opposite one another. These pins may, for example, be made in the form of screws which are threaded into the plate 21. A plate 25, which can be pivoted or swung about the central axis of the plate 21, is mounted on the plate 21, and can be guided during its rotation, for example by means of a flange or projecting edge 26 of the plate 21. The plate 25 is provided with two elongated curved slots 27, 28, through which project the screws 23, 24. The plate 25 is further provided with two lateral flanges 31, 32, in which a pair of rollers 33, 34 is mounted, the rollers of which are likewise spaced to provide sufficient play according to the thickness of the strip.

The upper plate 25 is further provided with one or more recesses 35, 36, in which a sprung stop 37 engages when the plate 25 is twisted round.

The strip is laid by means of the laying device, as shown diagrammatically in Figure 6. The strip 38 is secured by its free end to a post 39. The laying apparatus as shown in Figures 1 and 2 is simply held by the handle 1 and the strip is withdrawn by the operator walking forwards in the desired direction of laying. The apparatus may conveniently be held so that the axis of the handle 1 runs approximately horizontally in the direction in which the strip is dispensed or laid. Consequently the spool 16 rotates first about its axis as the unwinding progresses; furthermore the strip is twisted or turned between the pairs of rollers 19, 20 and 33, 34, in relation to the disc 21, which is fixed to the frame of the device, according to the setting of the upper disc 25. This twisting of the strip exerts a reaction of the spool 16, including the spool carrier 5, so that the carrier 5, with the spool 16, rotates about the spindle 2, according to the torque. This rotation is insufficient, however, to compensate for the twisting occurring between the pairs of rollers 19, 20 and 33, 34, and in particular for the permanent portion of the deformation; instead the strip running out from the pair of rollers 33, 34 remains twisted in such a manner that each successive portion is further twisted in relation to the preceding portion. Thus during laying, a strip is obtained which is evenly twisted along its entire length. The strip 38 can then again be secured to a suitable support, for example, a post, at the desired distance from the starting point 39, and may continue to be laid, with progressive twisting, as long as the supply of strip lasts.

Figure 5 shows diagrammatically the twisting of the pairs of rollers 19, 20 and 33, 34 and hence the extent of the twisting to which the strip is subjected between the pairs of rollers. If the plate 25 is provided with several recesses 35, 36, the extent of this twisting can be adjusted accordingly.

The invention is in no way restricted to the particular embodiment of the laying apparatus described. The whole arrangement of this apparatus as well as the individual structural details thereof may be altered and amended as desired, within the framework of the inventive idea. For example, the frame serving to take the spool to be unwound, and the handle, or the connection of this frame to a mobile or movable frame base may be designed as desired. The frame 5 of the strip could, for example, be rotatably connected to a carriage in such a manner that the axis of rotation lay substantially in the direction of motion. Likewise the device provided at the delivery end of the strip, by means of which the strip is twisted, can be designed as desired. Instead of rotatable rollers, for example, fixed guide devices could be provided. Furthermore the rotation of the spool about its second spindle could be brought about by means of other mechanical driving and transmission members, for example by the force of an additional spring which is automatically released by the progressive laying of the strip. Furthermore the same rotational movement could, in certain circumstances, also be derived directly from the rotating spool spindle of the spool carrier.

In each case it is important that the strip, with its notches, should be so formed that it can be wound and unwound flat in the form of a spool. It is not absolutely essential for the supply of strip to be wound in the form of a flat, spiral spool, like a roll of film. The entire supply of strip could also be wound in other ways, for example like a spool of yarn. Examples of flat formations of the strip which could be wound up, including their spikes, are shown in Figures 7 to 10. The spikes of the strip may here be formed, for example, by stamping holes out of a solid strip of metal. With this flat formation there is no difficulty in winding and unwinding the strip. During the subsequent twisting of the strip, however, the spikes of the strip point in all directions. Particular advantages are offered by the use of a strip, the edges of which are like cutters so that the spikes of the laid strip exert not only a pricking but also a cutting deterrent effect. Such a formation of the strip is obtained, for example, if it is made with a bulged cross-section as shown in Figure 11, for example by rolling. The cutting effect may also be achieved by subsequent rolling or grinding of the finished strip provided with barbs. Figure 9 shows a portion of a strip as shown in Figure 8, in the twisted state.

The fencing strip may conveniently be made from material which can be rolled, particularly from metal, for example steel. Other materials are not excluded, however, such as plastic of sufficient strength, elasticity and hardness.

I claim:

1. A device for laying fencing material consisting of a substantially flat strip having teeth along the lateral edges thereof, said device comprising a handle, a longitudinal bore through said handle, a spindle rotatably mounted inside said bore and protruding from said handle at one end thereof, a frame rigidly mounted on said handle attached to said protruding end of said spindle, a shaft centrally mounted on said frame at right angle to said spindle, a spool rotatably mounted on said shaft for receiving the fencing material thereon, and transmission means mounted on said frame at its side opposite said handle, for guiding the loose end of said strip and giving a twist to the latter when said strip is being unwound from said spool.

2. A strip twisting and dispensing arrangement for forming a deterrent obstacle from a flat strip of deformable material capable of retaining a twist the edges of which strip are discontinuous, said arrangement comprising carrier means for carrying a coil of the strip whereof the convolutions are superposed upon each other, said carrier means being so constructed and arranged as to permit unwinding of the strip when the free end thereof is anchored and said carrier means is moved away from said anchored end; and twisting means for imparting a twist to said strip as the same unwinds from said coil during movement thereof away from said anchored end of said strip, whereby said strip is twisted by the force acting upon said coil to move the latter away from said anchored end of said strip.

3. A strip twisting and dispensing device for forming a

deterrent obstacle from a flat strip of deformable material capable of retaining a twist the edges of which strip are discontinuous, said device comprising, in combination, a support; carrier means on said support for carrying a coil of the strip whereof the convolutions are superposed upon each other, said carrier means being so mounted on said support as to permit unwinding of the strip when the free end thereof is anchored and said support is moved away from said anchored end; and twisting means on said support for imparting a twist to said strip as the same unwinds from said coil during movement of said support away from said anchored end of said strip, whereby said strip is twisted by the force acting upon said support to move the latter, together with said carrier means carrying said coil and said twisting means, away from said anchored end of said strip.

4. A strip twisting and dispensing device for forming a deterrent obstacle from a flat strip of deformable material capable of retaining a twist the edges of which strip are discontinuous, said device comprising, in combination, a support; carrier means on said support for carrying a coil of the strip whereof the convolutions are superposed upon each other, said carrier means being so mounted on said support as to permit unwinding of the strip when the free end thereof is anchored and said support is moved away from said anchored end; and twisting means on said support for imparting a twist to said strip as the same unwinds from said coil during movement of said support away from said anchored end of said strip, said twisting means comprising two pairs of guides which pairs act successively upon the strip being unwound from said coil, the two guides of each pair being spaced from each other a distance sufficient to permit the passage of the unwinding strip between the guides with the guides of one pair being spaced from each other in a direction which is angularly displaced from the direction in which the guides of the other pair are spaced from each other and with said pairs being spaced sufficiently closely together to impart a permanent twist to the strip.

5. A strip twisting and dispensing device for forming a deterrent obstacle from a flat strip of deformable material capable of retaining a twist the edges of which strip are discontinuous, said device comprising, in combination, a support; carrier means on said support for carrying a coil of the strip whereof the convolutions are superposed upon each other, said carrier means being so mounted on said support as to permit unwinding of the strip when the free end thereof is anchored and said support is moved away from said anchored end; and twisting means on said support for imparting a twist to said strip as the same unwinds from said coil during movement of said support away from said anchored end of said strip, said twisting means comprising two pairs of rollers which pairs act successively upon the strip being unwound from said coil, the two rollers of each pair being spaced from each other a distance sufficient to

permit the passage of the unwinding strip between the rollers with the rollers of one pair being spaced from each other in a direction which is angularly displaced from the direction in which the rollers of the other pair are spaced from each other and with said pairs being spaced sufficiently closely together to impart a twist to the strip.

6. A device as defined in claim 5 wherein the orientation of said pairs of rollers relative to each other may be varied.

7. A device as defined in claim 5 further comprising a handle attached to said support, whereby the device may be held by hand while being moved away from said anchored end of said strip.

8. A device as defined in claim 7 wherein said support is of substantially U-shaped configuration, wherein said carrier means together with a coil of strip carried thereby as well as said twisting means are arranged between the legs of said support, and wherein said handle is attached to the base of said support.

9. A device as defined in claim 7 wherein said handle is rotatable with respect to said support about an axis which extends in the direction in which said support is moved away from said anchored end of said strip thereby permitting said support to rotate about said axis during movement away from said anchored end.

10. An arrangement of the character described, comprising in combination, a flat strip of deformable material capable of retaining a twist the edges of which strip are discontinuous, said strip being so coiled that the convolutions of the coil are superposed upon each other; carrier means for carrying said coil, said carrier means being so constructed and arranged as to permit unwinding of said coil when the free end of said strip is anchored and said carrier means is moved away from said anchored end; and twisting means for imparting a twist to said strip as the same unwinds from said coil during movement thereof away from said anchored end of said strip, whereby said strip is twisted by the force acting upon said coil to move the latter away from said anchored end of said strip.

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UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

Patent No. 2,908,132 October 13, 1959

Ernst Klemm

It is hereby certified that error appears in the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

In the grant only, line 1, name of inventor, for "Ernst Kelmm" read -- Ernst Klemm --.

Signed and sealed this 5th day of April 1960.

(SEAL)
Attest:

KARL H. AXLINE
Attesting Officer

ROBERT C. WATSON
Commissioner of Patents