

March 10, 1953

L. A. EDERER
NET FINISHING MACHINE

2,630,772

Filed Jan. 17, 1950

3 Sheets-Sheet 1

Fig. 1

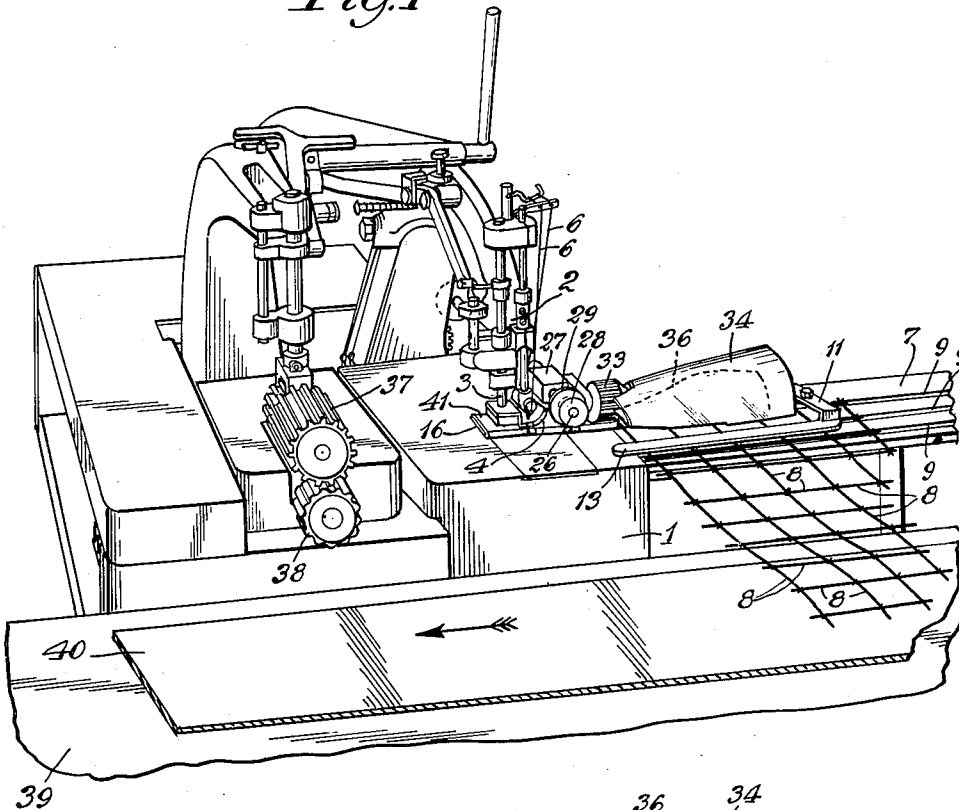
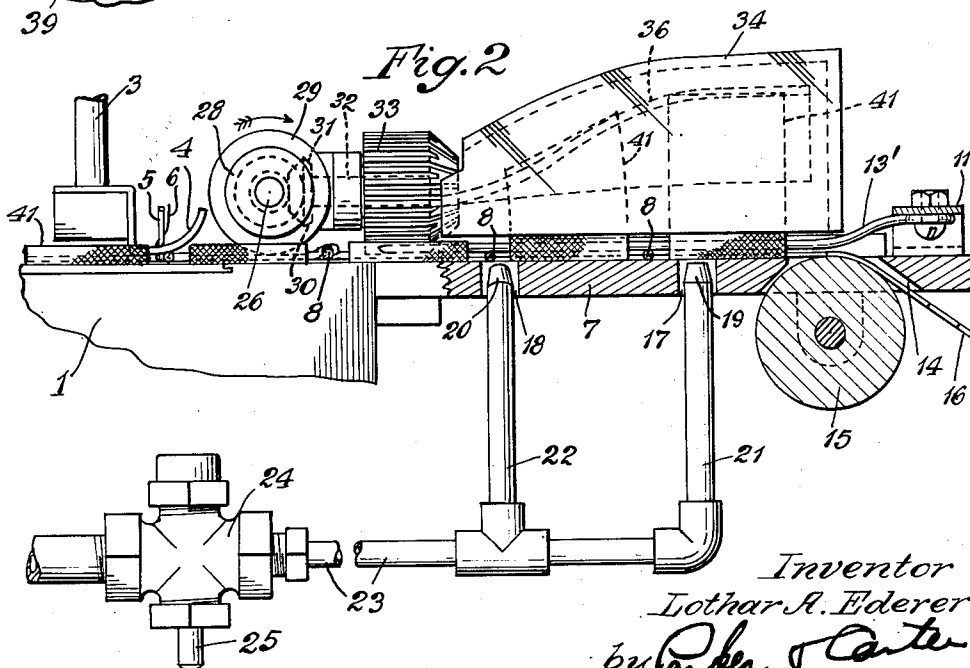


Fig. 2



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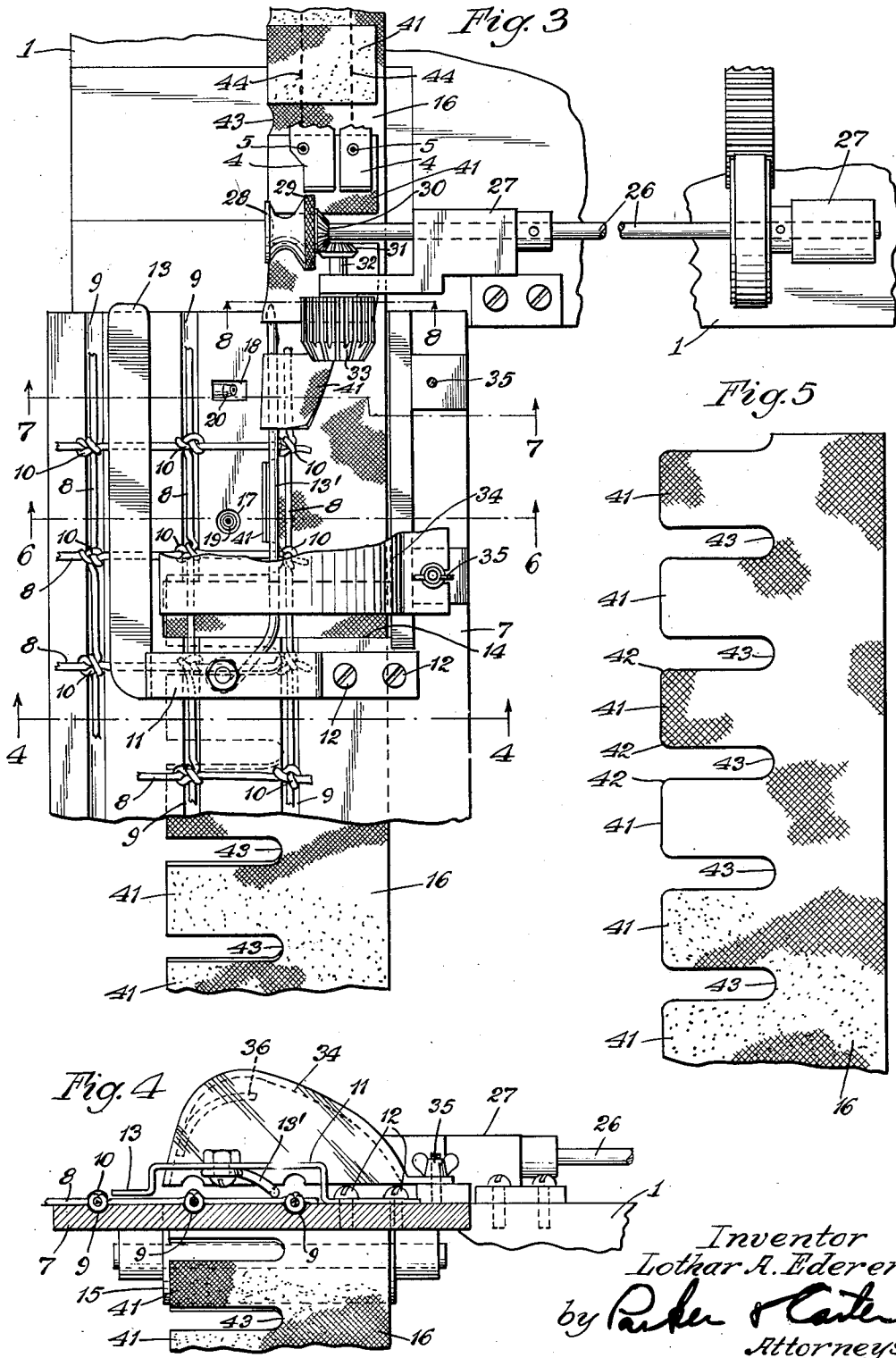
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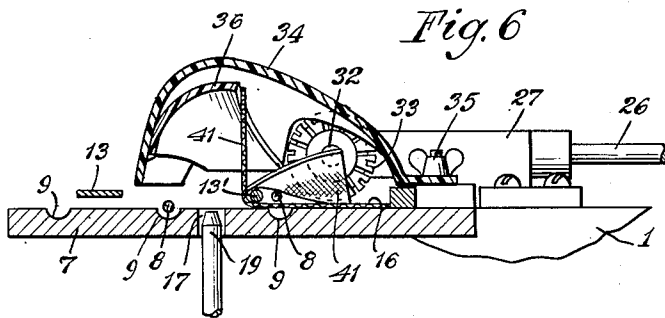
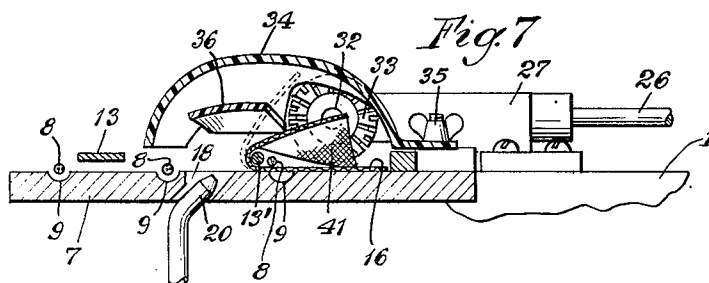
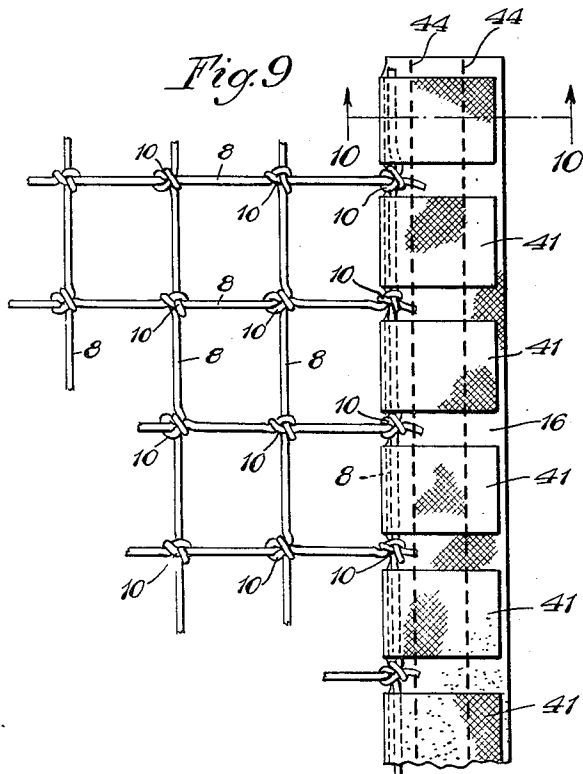
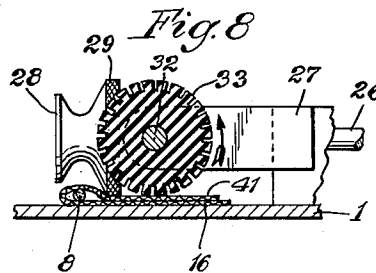
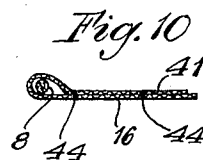
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NET FINISHING MACHINE

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3 Sheets-Sheet 3



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2,630,772

NET FINISHING MACHINE

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11 Claims. (Cl. 112—2)

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This invention relates to a machine and a method for applying a binding or finishing edge member to netting.

It has for one object to provide a machine by means of which a net is edged and the edging is shaped, turned and sewn in a complete and continuous operation.

Another object is to provide a folding means and method for turning an edging or binding strip about a net.

Another object is to provide means for drawing the turned edging or binding into proper position about the net.

Other objects will appear from time to time throughout the specification and claims.

The invention is illustrated more or less diagrammatically in the accompanying drawings, wherein:

Figure 1 is a perspective view of one form of the device;

Figure 2 is a side elevation on an enlarged scale with parts in section;

Figure 3 is a plan view of the portions of the device with parts omitted and parts broken away;

Figure 4 is a transverse vertical section taken at line 4—4 of Figure 3;

Figure 5 is a plan view of one form of binding;

Figure 6 is a transverse vertical section taken at line 6—6 of Figure 3;

Figure 7 is a transverse vertical section taken at line 7—7 of Figure 3;

Figure 8 is a transverse sectional detail taken at line 8—8 of Figure 3;

Figure 9 is a plan view of the finished bound net;

Figure 10 is a section taken at line 10—10 of Figure 9.

Like parts are indicated by like characters throughout the specification and the drawings.

In the particular form hereshown the mechanism as a whole comprises a sewing machine of any suitable type, conveying means for conveying netting, additional conveying means for conveying and binding, and means for shaping and positioning the binding about the net and preferably along its edge.

1 is a sewing machine base above which a sewing machine is positioned, indicated generally at 2. The details of the sewing machine form no essential part of the present invention and are not described, and only so much is described as is necessary for an understanding of the device itself. The sewing machine includes a rod 3 upon which a presser foot 4 is mounted. One or

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more needles 5 are used and threads 6 are sewn by the machine, preferably in two rows, as will be described hereinafter. The sewing machine proper is carried by suitable supporting means and may be of substantially conventional design.

Adjacent the sewing machine base 1 is a work supporting surface member 7 along which the edge of the net 8 is carried as it is moved toward the point of sewing. The upper surface of the member 7 is preferably grooved, as at 9, with one or more grooves. The knots 10 of the net 8 fit into a slide along the grooves 9 and, thus, the threads or cords of which the net is made are not, in normal operation, held above the ungrooved surface of the member 7. Extending across the member 7 and overlying one or more of the grooves 9 is a transverse supporting member 11 secured by screws 12, or otherwise, to the member 7. A downwardly disposed and preferably spring arm 13 extends along and above the member 7 and in the direction of the sewing mechanism. It is preferably disposed at such a height above the member 7 that it tends to hold the net in contact with the upper surface of the member 7. The members 11 and 13 may be integral or they may be formed separately. An additional guiding member 13' is positioned also to guide the net and to guide a binding, which will be described hereinafter, and to assist in the final shaping and positioning of that binding, as described hereinafter.

The member 7 is provided, as shown particularly in Figure 2, with an opening 14 beneath which is positioned a roller 15. The binding material 16 passes over the roller 15 and through the opening 14 in moving along toward the point of sewing. The member 7 is also provided with openings or perforations 17 and 18. An air nozzle 19 is positioned to discharge vertically or substantially vertically through the opening 17 and an air nozzle 20 is positioned to discharge air upwardly and laterally through the opening 18. The air nozzles 19 and 20 are connected respectively to air supply pipes 21 and 22 which are themselves connected to a supply pipe 23 to which a valve housing 24 is connected. A valve operating member 25 may be arranged to be operated merely by pressure such, for example, as the knee of the operator, so that the pressure may, if desired, be turned off and on by movement of the knee, otherwise a manually or otherwise operated valve may be used instead.

A shaft 26 is positioned in suitable bearings 27 and is driven from any suitable source. Adjacent one end it carries a conveying rotor 28

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provided with an annular groove, as shown in Figure 3, and provided also with a knurled edge portion 29. Fixed on the shaft 26 is a beveled gear 30 which meshes with the beveled gear 31 on a shaft 32. A roughened and preferably flexible conveying rotor 33 is also fixed on the shaft 32 and positioned to contact parts of the tape 16, as will be described hereinafter. The rotor 33 is preferably formed of rubber or rubber-like material, but it may be formed of other material if desired.

The hood 34 is removably positioned over that portion of the member 7 which lies in the neighborhood of the nozzles 19 and 20. The hood is held removably in place by thumb nuts 35, or otherwise. Its main purpose is to shield the operator from the blast of air emerging from the nozzles 19 and 20. Positioned within the shield member 34 is a guiding portion 36 which, as shown in Figures 2 and 7 in particular, is shaped downwardly to assist in guiding and positioning parts of the binding material as the latter is moved along toward the point of sewing.

Positioned adjacent the sewing machine, and on the opposite side from the structure thus far described, is a pair of conveying rollers 37, 38. These are driven in any suitable manner and are effective to engage and convey the net after the binding has been attached to it and sewn in place.

Adjacent the sewing machine assembly and the other parts thus far described is a surface forming member 39 upon which a conveying belt 40 is positioned and along which the belt moves in the direction of the arrow of Figure 1. The main body of the net lies upon the conveying belt 40 and is carried along as the net moves to and through the sewing machine and as the binding is applied. Any suitable means for driving the conveying means may be used and the belt may be of any desired size and construction. It is, ordinarily, at least as wide as that portion of the net which lies upon it. The conveying mechanisms thus far described serve to convey the net and the binding before sewing and the completed net after sewing from a point of supply to a point of collection for packaging. The net comprises, as shown, a woven or knotted net. In the particular form hereshown, the net is formed of cords or threads 8 knotted together as at 10 to form meshes. The invention may be applied, however, to nets of other construction and to mesh fabric and to fabric generally which is provided with openings of sufficient size for carrying out the operation disclosed below. The net may be made of any desired material, such as vegetable or animal fibers, and of metallic wire or synthetic fibers, or a combination of any of them.

The binding, as shown in Figure 5 in particular, comprises a main continuous portion 16 which is cut or otherwise shaped to provide a plurality of integral, laterally projecting tabs 41. The corners of the free ends of the tabs are preferably rounded at 42, as shown in Figure 5, and the binding is preferably rounded at 43 where the tabs join the main body 16 of the binding.

In the completed net, as shown in Figure 9, the tabs 41 have been inserted through the meshes and folded or wrapped about one of the net cords 8. In this case it is the outermost or side member 8. The tabs are sewn to the portion 16 by one or more rows of stitches 44. The binding is preferably coated or impregnated with a wax or a wax-like material which gives it some stiffness. The binding is initially in the form shown

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in Figure 5. Subsequently, as will be described hereinafter, the tabs are bent upwardly. The degree of stiffness given to them by the wax or other material with which they are impregnated is sufficient to cause them to tend to remain in whatever shape or position they may be moved into.

Although I have shown an operative form of my invention, it will be recognized that many changes in the form, shape and arrangement of parts can be made without departing from the spirit of the invention, and my showing is, therefore, to be taken as, in a sense, diagrammatic.

The use and operation of this invention are as follows:

With the machine assembled as shown a quantity of netting is moved toward the sewing assembly. The netting is largely conveyed by the conveying belt 40 and an edge portion of it is positioned upon and moved along the member 7. At the same time, a strip of binding is fed over the roller 15 through the opening 14 and beneath the net into the position indicated generally in Figures 3 and 4. The member 13 tends to hold the net down in a flat position. As the binding is moved toward the sewing machine proper, the tabs pass successively over the nozzles 19 and 20. The nozzle 19 blows each tab upwardly into the generally vertical position shown in Figure 6. The degree of stiffness of the tab is such that it tends to retain this position and does not tend to fall backward after it has passed beyond the nozzle. As the tab which has been moved into vertical position, as shown in Figure 6, moves along it is struck by the angular jet emerging from the nozzle 20 and is blown into the position of Figure 7. A guide portion 36 of the hood or cover member 34 is so shaped and placed that as the now vertical tab moves toward the sewing machine it is contacted by the inclined edge of the portion 36 and is additionally moved downward to the position of Figure 7. Thus, the tab, having been moved to approximately a vertical position by the blast of air emerging from the nozzle 19, is moved toward a downward and folded position, as shown in Figure 7, under the influence of the blast of air moving from the nozzle 20, and it is also urged in this direction and additionally retained in this position by the edge of the guiding member 36. As the folded tab is carried along farther toward the sewing machine it is engaged by the rotor 33. This operation is shown fully in Figure 8 and is about to commence in the case of the leading tab as shown in Figure 3. The effect of the operation of this rotor 33, which rotates in the direction of the arrow shown in Figure 8, is to move the tab into contact with the base portion 16 of the binding and also to tend to hold it in that position. The tab, as it is moved first to the vertical position of Figure 6 and thereafter to the inclined position of Figure 7 and finally to the flattened position of Figure 8, is folded about and, to some degree, guided by the member 13'. It occupies the position and relationship shown in Figure 8 at the time that it goes under the presser foot 4 of the sewing machine and at the time that the rows of stitches 44 are formed. Thus, the mechanism properly positions the binding along the edge of the net and positively and automatically moves the tabs through the net meshes, thereafter folds them to proper position and retains them in that position until they are sewn finally into place.

As the net, with the binding in place, is carried along from the sewing machine it is en-

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gaged between the conveying rollers 37 and 38, and these rollers, together with the belt 40, carry the completed bound net away from the sewing machine and to a point of disposal, collection or packaging.

I claim:

1. In combination in a net finishing assembly, a sewing machine, means for moving a net and a binding together toward said machine, means in advance of said machine for moving portions of said binding through openings in said net and about portions of said net, positioned beyond said first binding portion moving means, in the direction of net movement additional means for thereafter folding said portions of said binding upon the binding itself, said sewing machine constituting means for finally sewing said portions upon said binding.

2. In combination in a net finishing assembly, a sewing machine, means for conveying a binding and a net together toward said sewing machine, means in advance of said machine for moving portions of said binding through openings in said net and about portions of said net, positioned beyond said first binding portion moving means, in the direction of net movement additional means for thereafter folding said portions of said binding against the binding itself, said sewing machine constituting means for finally sewing said portions upon said binding.

3. In combination in a net finishing assembly, a sewing machine, means for moving together a binding and a net toward said sewing machine, means for thereafter moving portions of said binding through openings in said net and about portions of said net, positioned beyond said first binding portion moving means, in the direction of net and binding travel additional means for folding said portions of said binding against the binding itself and for retaining them in that position until sewing, said sewing machine constituting means for sewing said portions upon said binding.

4. In combination in a net winding machine, a sewing machine, means for conveying a net and a binding to said sewing machine, means for moving tabs through openings in said net, said means including a plurality of air blast producing means, means for positioning said tabs tightly against said binding, and means for moving said net and binding with its tabs so positioned to and past said sewing machine to sew said tabs upon said binding.

5. In combination in a net binding machine, a sewing machine, means for conveying a net and a binding to said sewing machine, means for moving tabs through openings in said net, said means including a plurality of air blast producing means and additional means for moving said tabs toward said binding, means for positioning said tabs tightly against said binding, and means for moving said net and binding with its tabs so positioned to and past the said sewing machine to sew said tabs upon said binding.

6. In combination in a net binding machine, a sewing machine, means for conveying a net and a binding provided along one edge with separated tabs to said sewing machine, means for moving said tabs through openings in said net, said means including a plurality of air blast producing means, means for positioning said tabs tightly against said binding, and means for moving said net and binding with its tabs so positioned to and past said sewing machine to sew said tabs upon said binding.

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7. In combination in a net binding machine, a sewing machine, means for conveying a net and a binding provided along one edge with separated tabs to said sewing machine, means for moving said tabs through openings in said net, said means including a plurality of air blast producing means and additional means for moving said tabs toward said binding, means for positioning said tabs tightly against said binding, and means for moving said net and binding with its tabs so positioned to and past the said sewing machine to sew said tabs upon said binding.

8. In combination in a net finishing machine, means for conveying a net; means adjacent thereto for positioning and guiding said net and means holding the net while in motion in guiding relation with said guiding means; and means for bringing a binding in contact with said net adjacent the edge portion of the latter; means positioned adjacent said guiding means for moving portions of said binding through meshes in said net; additional means positioned beyond said first means in the direction of movement of said net and binding for folding said portions of said binding upon itself and about a portion of said net.

9. In combination in a net finishing machine, means for conveying a net; means adjacent thereto for positioning and guiding the edge portion of said net and yielding means biased to hold the net against displacement from said guiding means while the net is in motion along said guiding means; and means for bringing a binding in contact with said net adjacent the edge portion of the latter; and means for conveying said binding in the same direction and at the same speed as said net; means positioned adjacent said guiding means for moving portions of said binding through meshes in said net; additional means positioned beyond said first means in the direction of movement of said net and binding for folding said portions of said binding upon itself and about a portion of said net.

10. In combination in a net finishing machine adapted to apply to a net formed of cords and including knots and open meshes a continuous binding formed with projecting tabs; means for moving a net and means for engaging and guiding said net during such movement; means for applying said binding to said net adjacent its edge; means positioned adjacent said guide and adapted to move a tab of the binding through a net mesh; additional means positioned therebeyond in the direction of net movement adapted to cause folding of a tab about a net member and upon the body of the binding.

11. In combination in a net finishing machine adapted to apply to a net formed of cords and including knots and open meshes a continuous binding formed with projecting tabs; means for moving a net and means for engaging and guiding said net during such movement; said guiding means comprising a member formed with continuous grooves aligned in the direction of net movement and adapted to receive the knots of said net; a yielding member biased to hold the net in contact with said guiding means during its movement therealong; means for applying said binding to said net adjacent its edge and means for holding said binding and said net together during their movement; means comprising an air jet member positioned adjacent said guide and adapted to move a tab

of the binding through a net mesh; additional means positioned therebeyond in the direction of net movement and comprising a second air jet means and a fixed scroll adapted to cause folding of a tab about a net member and upon the body of the binding; and additional mechanical means positioned still further along in the direction of net travel and adapted additionally to press successive binding tabs into contact with the body of the binding.

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