Aug. 4, 1936. F. STEINHART 2,049,752

WELDING JOINT FOR WIRE CLOTH

Filed March 16, 1935

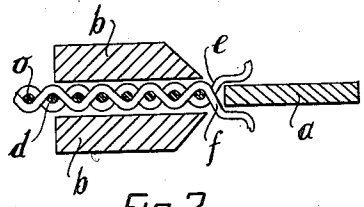


FIG 2.

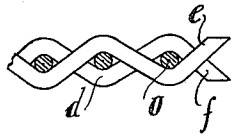


FIG. 3.

FIG. 1.

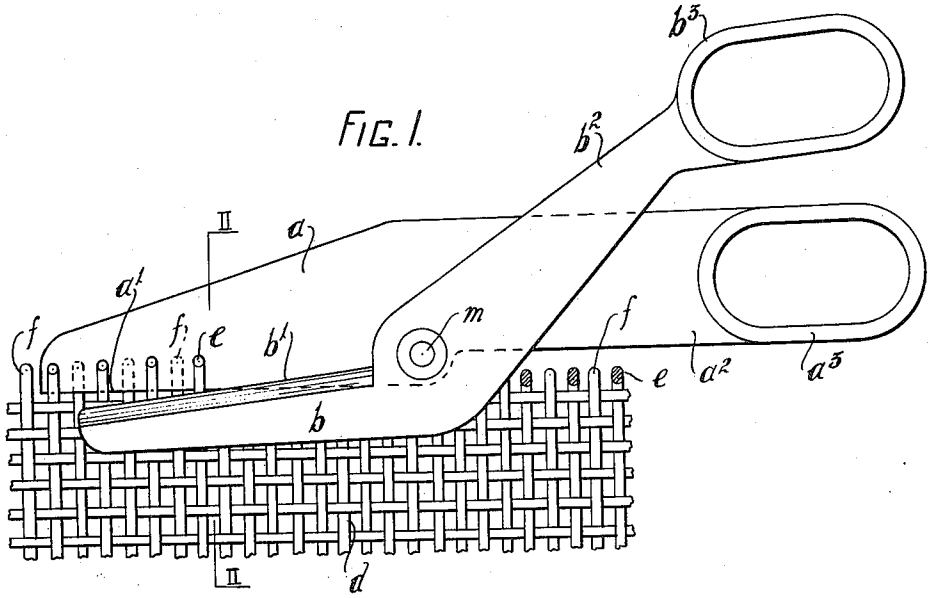


FIG. 4.

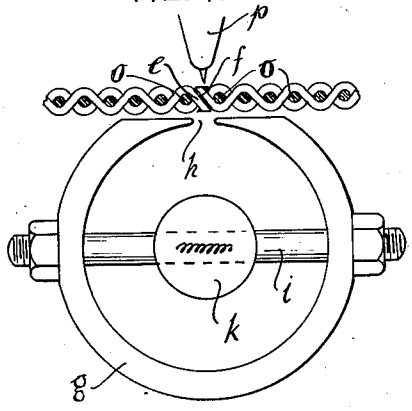


FIG. 5.

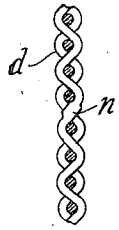
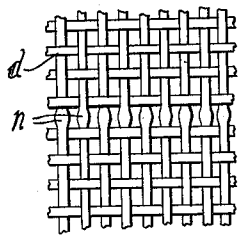


FIG. 6.



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WELDING JOINT FOR WIRE CLOTH

Ferdinand Steinhart, Munich, Germany

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In Germany March 21, 1934

8 Claims. (Cl. 140—3)

This invention relates to an improved method of and apparatus for uniting together sections of woven wire fabric by welding, for the manufacture, for example, of wire cloths for paper making machines, by withdrawing weft wires from the edges of the sections of wire cloth to be united, bringing the edges of the sections together with the warp wires of the two sections touching one another, and finally welding the ends of the warp wires together.

It is one of the objects of the present invention to produce a fabric which will have substantially the same size of mesh at the welded joint as elsewhere and also to avoid marking or tearing of the paper web or damage thereto when used in paper making machinery.

The invention consists in uniting together the sections of the woven wire fabric by withdrawing one or more weft wires from the edge of each of the sections to be united, thereafter opening apart the crossed ends of the warp wires of each section up to where they cross over the last weft wire, shortening the opened outends of the warp wires by severing them to uniform lengths so that the warp wire ends terminate in sloping portions ending in the planes of the upper and lower faces of the fabric, thereupon assembling the sections in coplanar abutting relationship with the warp wires of one section in alignment with the warp wires of the other section and with the sloping end portion of each warp wire of one section in parallel abutting relation with the sloping end portion of a warp wire of the other section, and finally welding together the abutting end portions of the warp wires.

The warp wires may be trimmed to uniform lengths by means of a cutting tool or shears.

The welded joint produced by the improved method does not appreciably protrude beyond either face of the wire fabric and the meshes at the joint are of substantially the same size as the meshes throughout the fabric.

The cutting tool or shears preferably comprise two parallel cutters, spacially separated from each other throughout their length and each comprising a handle and a cutting blade and cooperating in scissors-like fashion with a central guide blade situated between the two cutters. Preferably the central guide blade is interchangeable and the two cutters are adjustable to different distances apart in order to adapt the shears to different thicknesses of wire fabrics.

Fig. 1 of the accompanying drawing represents a view of the trimming tool in operation.

Fig. 2 is a section on the line II—II of Fig. 1.

Fig. 3 is a sectional view of part of the cloth showing the position and shape of the wire stubs after they have been trimmed.

Fig. 4 is an end view of a welding support suitable for carrying out the method, the wire cloth being shown in section.

Fig. 5 is a cross-sectional view of the cloth showing the joint, and

Fig. 6 is a plan view showing the joint.

The ends of the wire cloth d are prepared for welding by the removal of one or more of the weft strands o from the end edge of each of the two sections of wire cloth to be joined and the loose crossed end e, f of the warp strands are then opened out or uncrossed by means of a needle which is run at an angle (after the manner of using a letter opener) through the opening left by withdrawing the weft wires. As the strands are unequally bent and straggling, they must be trimmed to allow proper welding. The trimming is effected by means of a tool as illustrated in Fig. 1. This tool comprises a central guide blade a pivotally connected by a pivotal connection m to two side cutters, spaced apart throughout their length to allow the guide blade to move between them. Each side cutter comprises a cutting blade b and a handle b^2. The guide blade a is inserted in the bifurcation of the Y-shaped or bifurcated wire ends e, f with the blades b of the cutters on each side of the unbifurcated portion. The blades a and b are then closed upon each other by manipulating the shears after the manner of an ordinary pair of scissors, thereby simultaneously cutting both projecting ends e, f of the Y-shaped or bifurcated wire to uniform lengths, with the severed faces in planes parallel to the plane of the unbifurcated portion. The central blade a of the shears may be interchangeable and the side cutters may be adjustable apart by adjusting the pivotal connection m to suit wires or wire fabric of different thicknesses.

It will be noted, on referring to the drawing, that the cutting edge a^1 of the central blade a is preferably straight, and that the handle a^2 of the central blade is so formed that it lies above the line of the cutting edge a^1. Consequently, when the cutting edge a^1 is moved along the groove formed by the bifurcations of the Y-shaped or bifurcated ends e, f of the wires of the wire fabric, the handle portion a^2 will be above and clear of the base of the groove formed by the bifurcations. It is also to be noted that the two side cutters are cranked so that the cutting edges b^1 of the side blades b make an obtuse angle with the handles b^2. When the apertured ends a^3 and

b^3 of the handles are brought close together, the cutting edges b^2 are disposed at a very small cutting angle to the cutting edge a^1 and this ensures easy shearing of the bifurcated ends *e*, *f* of the wires. The cutting edges b^1 are preferably also straight as shown. The construction of the shears as above described and as shown in Fig. 1 enables the cut fabric to pass through between the side blades *b* below the pivotal connection *m* without any hindrance, while the straight formation of the cutting edge a^1 assists in guiding the shears in a straight path through the groove formed by the bifurcated ends *e*, *f* of wire. On the tool being operated while in the illustrated position, the warp strands *e*, *f* will be trimmed and only short, straight, obliquely disposed stubs will be left as shown in Fig. 3. As the tool is run in this manner along the edge of the cloth, it is easy to manipulate it so that all the stubs will be of equal length and no longer than required for the production of a neat welding joint. The ends *e*, *f* of the opened-out warp wires are thus cut in planes parallel to the faces of the wire cloth and the sections of wire cloth are then brought together by abutting the sloping end portions *e*, *f* of the warp wires as shown in Fig. 4, the warp wires being so aligned that the upwardly sloping end portion of one warp wire rests against the downwardly sloping end portion of an aligned warp wire and vice-versa. The sloping end portions of the warp wires are then welded together as shown in Figs. 4, 5 and 6.

It will of course be understood that the drawing shows the fabric to an enlarged scale and that the illustrations are exaggerated for the sake of clearness.

The warp wire ends of a section are cut and trimmed to the required length by the shears, so that, when the two sections of fabric are brought together as in Fig. 4, the warp wire ends will not protrude beyond either face of the fabric. Moreover, by bringing the sloping end portions together as in Fig. 4, the end weft wires *o* of the two abutting sections are substantially the same distance apart as the pitch of the weft wires *o* throughout the fabric.

It is noteworthy to mention that, when the sections of fabric are assembled and welded together in the manner described, the molten metal runs down the sloping end portions *e*, *f* of the warp wires and results in a weld blob *n* (Figs. 5 and 6) which is substantially centrally disposed between the two end weft wires of the abutting sections, and that the welding operation does not result in the formation of protruding weld blobs protruding beyond the face of the fabric.

The welded seam does not require to be subsequently rolled flat and, as the fabric sections are welded together in coplanar relationship, the fabric does not require to be straightened out after welding, and therefore there can be no damage to or weakening of the welded seam such as might arise on straightening out the fabric if the two sections of wire fabric were welded together while at an angle to each other.

For welding the ends of the wire-cloth together, a welding support is employed which may take the form shown in Fig. 4. This support comprises an elongated, tubular body *g* which is provided with a flat top surface and which is slit along said surface from end to end. The ends of the wire-cloth are brought together on the flat surface of the body over the slit *h* and adjusted, as shown in Fig. 4, so that the stubs of one end will overlap the stubs of the other end in vertical planes, i. e. without restricting the width of the intervening meshes. The stubs are joined in this position by a welding torch *p*, and the joints *n* (Figs. 5 and 6) thus formed will be sufficiently neat to allow a free flow of the water and to prevent the paper from being detrimentally marked.

The slit *h* over which the welding takes place is preferably illuminated from within the body *g*, so that stubs which are not properly positioned can easily be detected and rectified. The illumination may be effected by means of an element *k* adapted at the same time to heat the body *g* so as to prevent moisture from being condensed within the latter.

The body *g* is traversed by screw bolts *i* by means of which it can be contracted for varying the width of the slit *h*.

The welding joint obtained in this manner is perfectly flat and need not be subjected to any difficult flattening treatment liable to widen the joint and to extend the marking of the paper. The ends of the wire-cloth need not be placed for welding at an angle to each other or juxtaposed in an upright position, and the subsequent straightening, accompanied by weakening of the joint, will be obviated.

I claim:

1. The method of uniting together sections of woven wire fabric, which consists in trimming the warp strands at the ends of the woven wire fabric so as to form obliquely disposed stubs of substantially even length, assembling the sections in substantially coplanar abutting relationship, the obliquely disposed stubs of the warp wires being so aligned that the upwardly sloping end portion of one warp wire rests against the downwardly sloping end portion of an aligned warp wire and vice-versa, and finally welding together the abutting end portions of the warp wires.

2. The method of uniting together sections of woven wire fabric, which consists in trimming the warp strands at the ends of the woven wire fabric so as to form obliquely disposed stubs of substantially even length, thereupon assembling the sections in substantially coplanar abutting relationship with the warp wires of one section in alignment with the warp wires of the other section and with the obliquely disposed stubs of each warp wire of one section being parallel and adjoining the obliquely disposed stubs of each warp wire of the other section, and finally welding together the abutting end portions of the warp wires.

3. The method of uniting together sections of woven wire fabric, which consists in opening apart the crossed ends of the warp wires of each of the sections to be united, trimming the warp strands at the ends of the woven wire fabric so as to form obliquely disposed stubs of substantially even length, assembling the sections in substantially coplanar abutting relationship, the obliquely disposed stubs of the warp wires being so aligned that the upwardly sloping end portion of one warp wire rests against the downwardly sloping end portion of an aligned warp wire and vice-versa, and finally welding together the abutting end portions of the warp wires.

4. The method of uniting together sections of woven wire fabric, which consists in withdrawing one or more weft wires from the edge of each of the sections to be united, thereafter opening apart the crossed ends of the warp wires of each of the sections to be united, trimming the warp

strands at the ends of the woven wire fabric so as to form obliquely disposed stubs of substantially even length, assembling the sections in substantially coplanar abutting relationship, the obliquely disposed stubs of the warp wires being so aligned that the upwardly sloping end portion of one warp wire rests against the downwardly sloping end portion of an aligned warp wire and vice-versa, and finally welding together the abutting end portions of the warp wires.

5. A woven wire fabric comprising two sections of wire fabric united together in coplanar relationship by a welded seam, the seam being located between two of the weft wires and formed by welding the overlapping adjoined ends of the warp wires of each section, the length of the overlapping portions being materially greater than the diameter of the wires, and the area of the mesh openings being substantially the same at the seam as in the body of the fabric.

6. The method of uniting together sections of woven wire fabric, which consists in trimming the warp strands at the ends of the woven wire fabric by a severing operation involving the use of triple-bladed trimming shears traversed along the edges of the fabric to be abutted so that the ends of the warp wires will be trimmed to terminate in sloping portions ending in the planes of the fabric, thereupon assembling the sections in substantially coplanar abutting relationship with the warp wires of one section in alignment with the warp wires of the other section and with the sloping end portions of each warp wire of one section being parallel and adjoining the sloping end portions of each warp wire of the other section, and finally welding together the abutting end portions of the warp wires.

7. The method of uniting together sections of woven wire fabric, which consists in opening apart the crossed ends of the warp wires of each of the sections to be united, trimming the warp strands at the ends of the woven wire fabric by a severing operation involving the use of triple-bladed trimming shears traversed along the edges of the fabric to be abutted so that the ends of the warp wires will be trimmed to form obliquely disposed stubs of even length, assembling the sections in substantially coplanar abutting relationship, the obliquely disposed stubs of the warp wires being so aligned that the upwardly sloping end portion of one warp wire rests against the downwardly sloping end portion of an aligned warp wire and vice-versa, and finally welding together the abutting end portions of the warp wires.

8. The method of uniting together sections of woven wire fabric, which consists in withdrawing one or more weft wires from the edge of each of the sections to be united, thereafter opening apart the crossed ends of the warp wires of each section up to where they cross over the last weft wire, shortening the opened out ends of the warp wires by severing them to uniform lengths at both sides of the fabric by a severing operation involving the use of triple-bladed trimming shears traversed along the edge of the fabric to trim the ends of the warp wires at the edges to be abutted so that the warp wires terminate in sloping portions ending in the planes of the faces of the fabric, thereupon assembling the sections in coplanar abutting relationship with the warp wires of one section in alignment with the warp wires of the other section and with the sloping end portion of each warp wire of one section in parallel abutting relation with the sloping end portion of a warp wire of the other section, and finally welding together the abutting end portions of the warp wires.

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