May 10, 1938. N. W. WEBB 2,116,812

SEAM WIRE AND METHOD FOR MAKING WIRE CLOTH SEAMS

Filed May 15, 1936

Fig. 1.

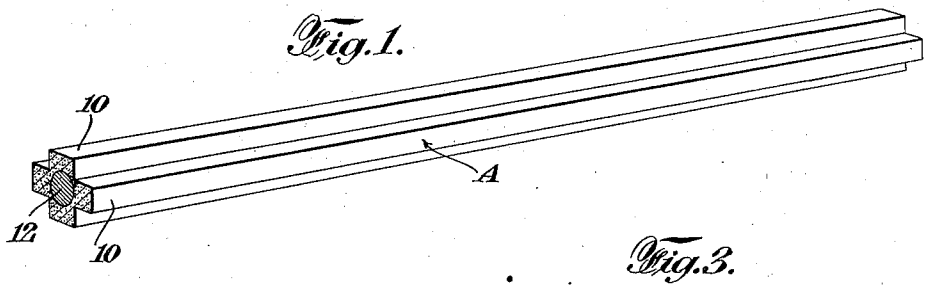


Fig. 2.

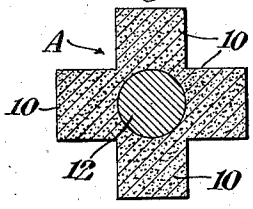


Fig. 3.

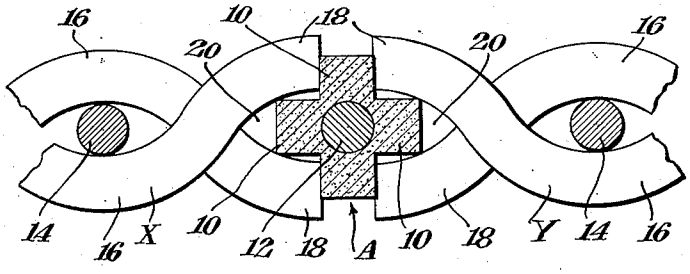


Fig. 4.

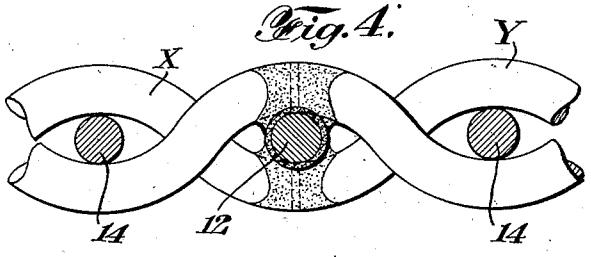


Fig. 7.

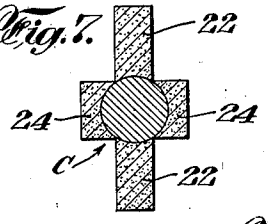


Fig. 5.

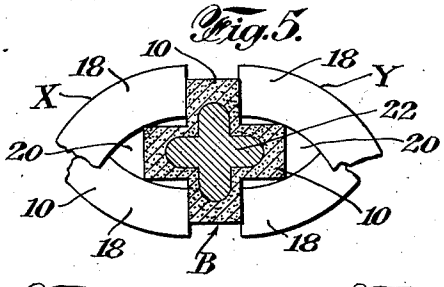


Fig. 6.

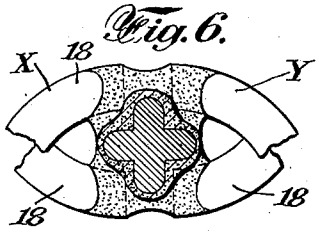


Fig. 8.

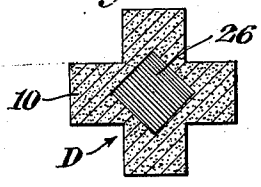


Fig. 9.

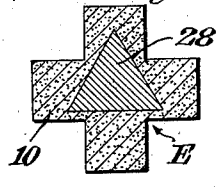
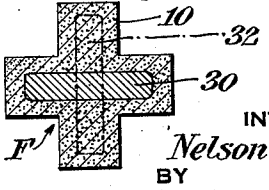


Fig. 10.



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SEAM-WIRE AND METHOD FOR MAKING WIRE-CLOTH SEAMS

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Application May 15, 1936, Serial No. 79,931

15 Claims. (Cl. 245—10)

My present invention relates to a novel seam-wire and a novel method of making brazed seams for Fourdrinier wire belts and wire fabrics used in paper making machines or in any other machine, device or location wherever usable.

The invention makes the production of perfect seams less dependent upon the skill and dexterity of the operator. It employs a novel seam-wire which automatically gauges, positions and guides the parts during the steps of the seaming operation. The result is that more uniformly perfect seams are more readily produced than heretofore.

The accompanying drawing and description disclose various seam-wires within the invention, it being understood that these are illustrative of preferred forms of the invention without, however, limiting the invention thereto, except as this may be required by the appended claims and the state of the art.

In the drawing which shows all of the parts on an enlarged scale:—

Fig. 1 is a perspective view of a piece of seam-wire within the invention;

Fig. 2 is an enlarged transverse section of the particular seam-wire shown in Fig. 1;

Figs. 3 and 4 show this same seam-wire in use to unite two wire-cloth ends shown fragmentarily in side edge view, Fig. 3 showing the parts before, and Fig. 4 after, heat has been applied to fuse the parts to form the seam, Fig. 4 showing the seam in vertical cross-section;

Figs. 5 and 6 are analogous to Figs. 3 and 4 respectively except that they show a modification of the seam-wire within the invention;

Figs. 7, 8, 9 and 10 show in transverse section further modifications of the seam-wire within the invention, Fig. 10 being a composite view showing alternate forms, wherein the full lines show the infusible core strip positioned horizontally on its side and the dotted lines show the alternative form where said strip is positioned vertically on its edge.

This invention uses a novel seam-wire, one embodiment of which is shown in Figs. 1 to 3, Fig. 4 showing in vertical cross section the seam resulting from its use.

Fig. 1 shows a short piece or length of this seam-wire A which it will be seen is longitudinally ribbed, the ribs 10 being so arranged that the wire has a cross-shaped transverse section as shown in Figs. 2 and 3. The seam-wire A is seen to have a longitudinal core. This core consists of a hard or relatively infusible wire 12 running the full length of the seam-wire preferably molded or otherwise embedded or contained therein, the rest of the wire including the rib portion thereof being composed of a suitable metal or metal alloy fusible at soldering or brazing temperatures. In this seam-wire the infusible core wire is round in cross section and may be substantially the same in kind of metal and gauge as the weft wires 14 in the wire cloth ends X and Y that are to be seamed together. In other words, this core wire may be composed of bronze, hard brass or any other material preferred or found suitable for the purpose of the invention. The ribbed portion of the seam-wire may consist of any metal, metals, or materials or a combination thereof, fusible at a temperature which will not damage the wire-cloth and which, on solidifying, will make a strong joint between the warp pickets 18 of the cloth-ends and the seam-wire. Ordinarily said ribbed portion of the seam-wire will be composed of solder which may be either a soft solder or a silver or other suitable hard solder.

To make a seam between the wire cloth ends X and Y using for example the seam-wire A (Fig. 1) the warp wires 16 are trimmed across each cloth-end at a removed weft-wire so that the residual portion of said warps conveniently called pickets 18 collectively define a groove in the edge of the respective cloth-ends, as shown, for example in end view at 20 in Fig. 3.

The two cloth-ends are then brought together as indicated in Fig. 3 with their said grooved edges in opposition and with the ribs 10 of the seam-wire that constitute one of the members of the cross seated in said grooves 20 and straddled by the pickets 18. The aforesaid ribs 10 and the cross-member which they compose are conveniently called the horizontal ribs and the horizontal cross-member respectively of the seam-wire although of course horizontal is only a relative term. What is meant is that they extend in the general direction of the plane of the cloth-ends which are ordinarily positioned horizontally as shown at X and Y in Fig. 3. On the same basis, the vertical member of the cross in Fig. 3 is composed of the vertical ribs 10 of the seam-wire. These extend as shown transversely to the plane of the cloth-ends so as to be located between said ends. Stated differently the pickets of the two cloth-ends straddle the horizontal ribs and project towards opposite faces of the vertically disposed ribs preferably into contact with said faces or substantially into contact therewith.

The cloth-ends being suitably supported in sub-

stantially the relation to the seam-wire indicated in Fig. 3 suitable heating means, not shown, is used to heat the pickets and the seam-wire to fuse the ribbed portions thereof, while the two cloth ends are being gently urged together so that on cooling a strong fused-metal joint is formed between the two sets of pickets, and between the pickets and the relatively infusible core of the seam-wire. Fig. 4 serves to inticate the general nature of the resultant seam as seen in vertical cross-section.

The remaining figures show some of the other modifications of seam-wire within the invention. The seam-wire B, Figs. 5 and 6 differs from A in the respect that its longitudinally extending infusible core **22** is cruciform in transverse section instead of being simply a round sectioned wire. The seam is made with this seam-wire B in the same way already described in connection with the seam-wire A. Fig. 5 shows the cloth-ends and the seam-wire B assembled prior to fusing, and Fig. 6 shows the resultant seam partly in vertical section after the fusing operation. The arms or ribs of the cruciform infusible core **22** preferably extend, as indicated in Fig. 5, into the corresponding arms or ribs **10** of the cruciform fusible portion of the seam-wire. An advantage of this is that the ends of the pickets **18** enter into the angles between the ribs of the cross-shaped core **22** in the fusion operation, with the result that an extra strong seam is formed between the hard metal parts as will be evident from an inspection of Fig. 6.

Fig. 7 shows the cruciform seam-wire C wherein the vertical fusible ribs **22** are radially longer than the horizontal ribs **24**. The ribs **22** are also relatively thin. Thus in the assembled position for fusing, corresponding to Fig. 3 or Fig. 5, the pickets of one cloth-end can approach closer to those of the other, namely more nearly into their final position. Also the ribs **22** can cover the entire free ends or extremities of the pickets for still more effective soldering thereof during the fusion step. On the other hand the relatively short and thick horizontal ribs **24** enter between and space the pickets and working in combination with the vertical ribs guide the pickets in their movement towards each other during the carrying out of the seaming operation. A round-sectioned infusible core-wire is shown in the aforesaid seam-wire C, Fig. 7, and the relation of the ribs thereto is such that its periphery extends into the base of said ribs, differing in this respect from A in Fig. 2. The purpose of this is to obtain some of the benefits described in connection with B in Fig. 5 wherein the ribs of the cross-shaped core extend into the fusible metal ribs.

The use of ribs of radially unequal length, as in the seam-wire of Fig. 7, is not limited to the round sectioned core shown in that figure because other differently sectioned cores shown herein or which are otherwise within this invention may be advantageously used with said radially unequal rib embodiments of the seam-wire.

Some other seam-wires having characteristics of this invention are shown in Figs. 8 to 10 inclusive, designated D, E and F respectively. The seam-wire D has a square-sectioned infusible core-wire arranged with its pointed edges extending into the ribs of the fusible cross shaped ribbed portion **10**. The seam-wire of Fig. 9 has a triangular sectioned infusible core whose pointed edges extend into three of the ribs of the fusible portion **10**.

The seam-wire of Fig. 10 has a rectangular cross-sectioned infusible core-strip **30** embedded in the horizontal cross-member of the fusible portion **10**. An alternative form is shown by the dotted lines **32** which are intended to indicate that this core strip may also be located in the vertical cross member, in other words, that the seam-wire F may be used with the rectangular sectioned core strip extending either in the plane of the cloth ends X and Y or transversely thereto.

Other forms of seam-wire have been proposed heretofore but the seam-wire of the present invention is peculiarly advantageous and effective. The horizontal and vertical ribs keep the lower and upper pickets of each cloth-end properly spaced relatively to each other, and also properly positioned relatively to the pickets of the other cloth-end, and also properly spaced and directed relatively to the infusible core of the seam-wire so that upon fusion and the simple urging together of the cloth ends by movement thereof in the plane of said ends, the pickets and the infusible core naturally come into proper relationship for making a strong fused-metal joint between the pickets themselves, and between them and the infusible core of the seam-wire. In connection with the foregoing it may be said that the vertical ribs act as stops for the pickets and that they cooperate with the horizontal ribs in lining up the cloth-ends and their pickets in the same plane or zone during the seaming operation.

It is preferred that the seam-wire of this invention shall have an infusible core, but nevertheless an all fusible cross-shaped seam-wire is regarded as being within the invention as is also a cross-shaped seam-wire which is composed altogether of infusible metal and wherein extra solder or brazing metal or simply welding heat is depended upon to finish the seam.

The thickness of the horizontal ribs is preferably such that the pickets resiliently grip said ribs as indicated in Figs. 3 and 5 which show the pickets with a greater spread than their normal spread shown in Figs. 4 and 6 respectively. In this way the assembled seam wire and cloth ends conveniently hold together in preparation for the brazing operation.

What I claim is:

1. For making wire-cloth seams, a seam-wire having a cruciform transverse section, said wire being composed of a relatively fusible material except that it has a longitudinally extending core composed of a relatively infusible material, said core having a cross section such that parts thereof project into the cross-pieces of the seam-wire.

2. For making wire-cloth seams, a seam-wire having a cruciform transverse section, said wire being composed of a relatively fusible material except that it has a longitudinally extending core composed of a relatively infusible material, said core having a cruciform transverse section, the cross-pieces of which extend into the cross-pieces of the seam-wire.

3. For making a wire-cloth seam, a seam-wire having a cruciform transverse section, said wire being composed of a relatively fusible material except that it has a longitudinally extending core composed of a relatively infusible material, said core having a rectangular cross-section with portions thereof extending into a cross-piece of the seam-wire.

4. For making wire-cloth seams, a seam-wire having a cruciform transverse cross-section, said wire being composed of a relatively fusible material except it has a longitudinally extending

core composed of a relatively infusible material, said core having a substantially square cross-section disposed so that its angles extend into the cross-pieces of the seam-wire.

5. For making seams between wire-cloth ends, a seam-wire having longitudinally extending horizontal and vertical ribs, the former of said ribs being adapted to be straddled in the plane of the opposed cloth-ends by the pickets thereof with the latter of said ribs located between the picket-extremities of one cloth-end and those of the other.

6. For making seams between wire-cloth ends, a seam-wire having longitudinally extending horizontal and vertical ribs, the former of said ribs being adapted to be straddled in the plane of the opposed cloth-ends by the pickets thereof with the latter of said ribs located between the picket-extremities of one cloth-end and those of the other, said seam-wire being composed of a relatively fusible material except that it has a longitudinally extending core composed of a relatively infusible material.

7. The method of making seams between wire-cloth ends, which comprises trimming the warp wires across the cloth-ends at a removed weft wire so that the remaining pickets collectively define a groove in the edge of the respective cloth-ends; interposing a longitudinally ribbed seam-wire between said edges of the cloth-ends arranged in opposition to each other, said ribbed seam-wire being substantially cross-shaped in transverse section, the ribs of one cross-piece being located in the plane of the opposed cloth-ends seated in the grooved edges thereof straddled by said pickets, the other cross-piece being transverse to the plane of the cloth-ends with the pickets of the two cloth-ends directed toward opposite faces thereof; and making a fused metal joint between said pickets and seam-wire.

8. The method of making seams between wire-cloth ends, which comprises trimming the warp wires across the cloth-ends at a removed weft wire so that the remaining pickets collectively define a groove in the edge of the respective cloth-ends, interposing a longitudinally ribbed seam-wire between said edges of the cloth-ends arranged in opposition to each other, said ribbed seam-wire being composed of fusible metal except for an infusible longitudinal core and being substantially cross-shaped in transverse section, the ribs of one cross-piece being located in the plane of the opposed cloth ends seated in the grooved edges thereof straddled by said pickets, the other cross-piece being transverse to the plane of the cross ends with the pickets of the two cloth-ends directed toward opposite faces thereof; and applying heat to said seam-wire and pickets to make a fused metal joint therebetween.

9. The method of making seams between the wire-cloth ends, which comprises trimming the warp wires across the cloth-ends at a removed weft wire so that the remaining pickets collectively define a groove in the edge of the respective cloth-ends, interposing a longitudinally ribbed seam-wire between said edges of the cloth-ends arranged in opposition to each other, said ribbed seam-wire being composed of fusible metal except for an infusible longitudinal core and being substantially cross-shaped in transverse section, the ribs of one cross-piece being located in the plane of the opposed cloth-ends seated in the grooved edges thereof straddled by said pickets, the other cross-piece being transverse to the plane of the cross-ends with the pickets of the two cloth-ends directed toward opposite faces thereof; and applying heat to said seam-wire and pickets to make a fused metal joint therebetween and at the same time moving the cloth-ends closer together.

10. A wire for connecting the adjacent ends of wire cloth together to form a joint or seam, said wire having longitudinal ribs, the ribs being so arranged that the wire as a whole has a cross shaped transverse section, said wire having a core portion composed of relatively infusible material and the ribs being composed of relatively fusible material.

11. A wire for connecting the adjacent ends of wire cloth together to form a joint or seam, said wire having longitudinal ribs, the ribs being so arranged that the wire as a whole has a cross shaped transverse section, said wire having a core portion composed of relatively infusible material and the ribs being composed of relatively fusible material, said core having a cross section such that parts thereof project into said ribs.

12. A wire for connecting the adjacent ends of wire cloth together to form a joint or seam, said wire having longitudinal ribs, the ribs being so arranged that the wire as a whole has a cross shaped transverse section, said wire having a core portion composed of relatively infusible material and the ribs being composed of relatively fusible material, said core having a cross shaped transverse section whose cross pieces extend into the fusible ribs of the wire.

13. A wire for connecting the adjacent ends of wire cloth together to form a joint or seam, said wire including a core of relatively non-fusible material and a covering for said core of relatively fusible material, said wire as a whole having a cruciform transverse section.

14. A wire for connecting the adjacent ends of wire cloth together to form a joint or seam, said wire including a core of relatively non-fusible material and a covering for said core of relatively fusible material, said covering being cross-shaped in transverse section.

15. A wire for connecting the adjacent ends of wire cloth together to form a joint or seam, said wire including a core of relatively non-fusible material and a covering for said core of relatively fusible material, said covering and said core being both cross-shaped in transverse section.

NELSON W. WEBB.