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R. W. FULLER

BELT JOINT AND METHOD OF MAKING SAME

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Fig. 1

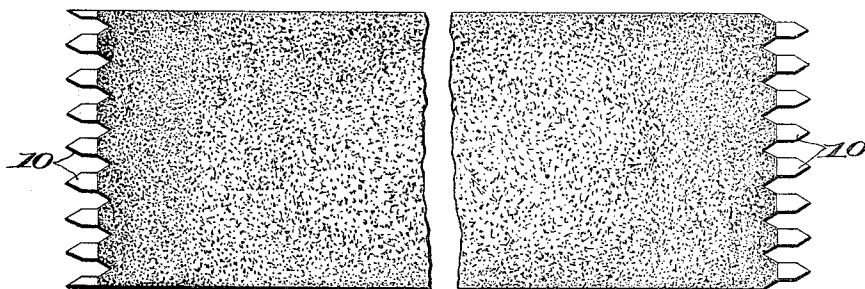


Fig. 2

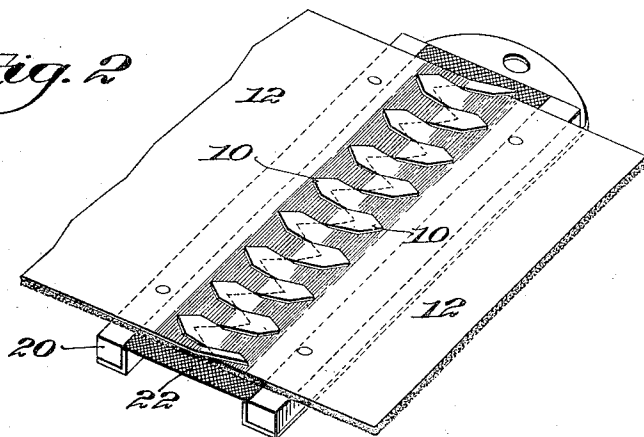
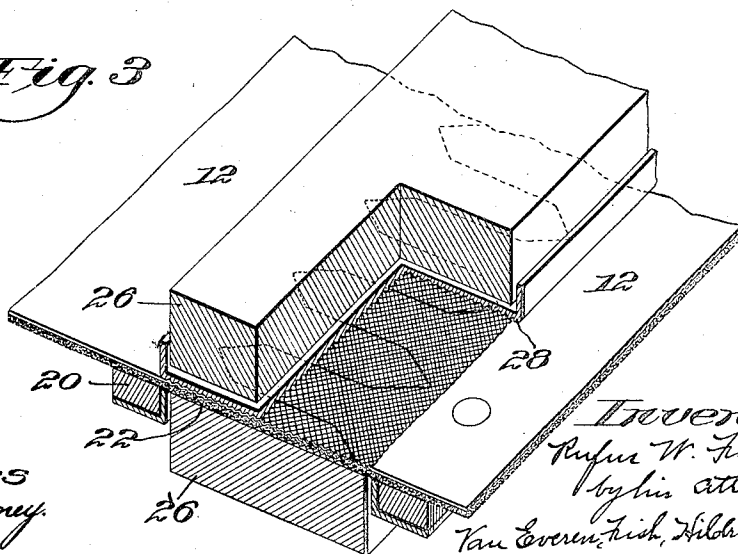


Fig. 3



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UNITED STATES PATENT OFFICE.

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BELT JOINT AND METHOD OF MAKING SAME.

Application filed November 14, 1922. Serial No. 600,979.

To all whom it may concern:

Be it known that I, RUFUS W. FULLER, a citizen of the United States, residing at Deerfield, in the county of Franklin and State of Massachusetts, have invented certain new and useful Improvements in Belt Joints and Methods of Making Same; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to a belt joint and more particularly to a belt joint of the type illustrated in United States Letters Patent No. 944,658, and to a method of making the same.

One of the objects of the invention is to improve the belt joint shown in said Letters Patent and to add to its strength and durability yet without increasing to an objectionable degree the thickness of the belt at the joint. A further object of the invention is to provide a method whereby the improved joint may be made in an easy and expeditious manner.

To the above ends the invention consists in the improved belt joint and method of producing the same hereinafter described and particularly pointed out in the claims.

In the drawings illustrating the preferred embodiment of the invention Fig. 1 is a plan of an abrasive belt showing the abrasive surface and the locking fingers formed at each end of the belt preparatory to joining these ends together; Fig. 2 is a perspective view showing the belt with the abrasive face downward and the fingers interlocked and in position ready to be pressed into the back of the belt to form the belt joint; and Fig. 3 also illustrates in perspective the belt with the abrasive face downward and with the belt joint in the jaws of the press by which the fibres of the fingers are pressed into the interstices of the fabric of the belt, a portion of the upper jaw of the press being cut away for purposes of illustration.

Abrasive belts comprise, in general, a body portion of firmly woven canvas or other fabric or rubber, upon one side of which a surface coating of emery or other abrasive is adhesively secured. The end portions of the abrasive belt are joined to form an end-

less belt arranged to travel over pulleys in a well-known manner in grinding machines, the back or smooth surface of the belt coming in contact with the pulley and the abrasive surface being positioned to engage the work being ground or polished.

Referring to the drawings, the improved belt joint is formed by means of fingers cut out or otherwise formed upon each end of the belt which are interlocked and lapped over upon the back of the belt. Heretofore it has been the practice to soften the glue or cement by means of hot water or steam and then to press the fingers firmly onto or into the belt between smooth surfaces. Such a joint, however, has been found unsatisfactory not only because of its lack of strength and durability, but also because of the substantial increase in thickness at the joint. In the present invention, in order to secure a maximum gripping effect between the fabric of the fingers and the fabric of the back of the belt to thereby produce a belt joint capable of withstanding maximum strain, provision is made for removing the abrasive material from the surface of the fingers as a preparatory step in forming the joint, so that when the fingers are lapped over upon the back of the belt, the contacting fabric surfaces are in condition to be adhesively and mechanically secured to each other in the most advantageous manner. A convenient manner of removing the abrasive material is to pass the end of the belt sidewise beneath an emery wheel or similar grinding tool, care being taken that only the abrasive material is removed, leaving a surface adhesive upon the face of the fabric. The ends of the belt are then brought together and the fingers are interlocked and adhesively secured in a lapping position upon the back of the belt.

In addition, it has been found desirable, in order to produce a belt joint of maximum strength, to subject the fingers to the pressure of a knurled plate or similar device for forcing the individual fibres of the fingers down into the interstices or spaces between the fibres of the back of the belt to secure a mechanical gripping action between the fingers and the belt. This is of particular advantage in the case of abrasive belts, for the reason that the fabric is so closely woven

that unless a knurled plate or other device having projections upon it, is utilized to press the fingers upon the belt, a belt joint will be formed whose strength depends
 5 solely upon the resistance to separation of the interlocked fingers and the shearing strength of the adhesive or glue. In testing belt joints formed according to the present method and those formed according to prior
 10 methods, such for example, as that disclosed in said patent, the improved belt joint has been found many times stronger. In addition to presenting a most desirable surface for the purposes of adhesively securing the
 15 fingers to the belt, the removal of the abrasive surface from the ends of the fingers assists in reducing the thickness of the belt joint so that a joint may be formed of practically the thickness of the body portion of
 20 the belt itself.

According to the preferred manner of producing the improved belt joint for an abrasive belt, the fingers 10 are died or cut
 25 out of a strip of abrasive cloth. One end of the belt is then placed upon a plate on a grinding table being positioned by pins projecting from the plate which engage the bottoms of the spaces or notches between adjacent fingers. The plate is then reciprocated
 30 on the table carrying the fingers transversely back and forth beneath an emery wheel which grinds off the abrasive from the surface of the tapered ends and shanks of the fingers without removing it from the
 35 widened bases. The other end of the belt is then similarly treated leaving the belt and fingers as shown in Figure 1. The ends of the belt are then brought into a contiguous position and fingers 10 interlocked. The end
 40 end portions of the belt are then tacked or otherwise secured to a supporting frame 20 having a wire mesh 22 as a supporting surface. The surfaces of the fingers 10 from which the abrasive has been removed and also
 45 the back of the belt are first provided with a priming coating of glue or similar adhesive and the frame 20 and belt are thereafter hung up to dry for several hours. After the priming coating has dried, a second or
 50 thicker coating of adhesive is applied to the surfaces of the fingers and to the back of the belt and the frame and belt are positioned between the jaws 26 of a press, (see Fig. 3). A knurled plate 28 is interposed between the
 55 upper jaw of the press and the back of the belt, the belt being supported at the joint by the wire mesh 22, and the belt joint is then subjected to sufficient pressure to firmly impress or force the fibres of the fingers down
 60 into the interstices of the fabric of the back of the belt to effect an actual mechanical gripping between the fingers and the belt. I have found that superior results may be obtained by the use of a knurled plate, although other devices may be used if found

desirable. The belt joint is permitted to remain under pressure in the press for a few minutes, usually only the time required to prepare another belt joint for pressing, after which it is removed from the press and
 70 placed under a weight where it remains for several hours until dry. The belt is then ready for use.

A belt joint formed in accordance with the present invention has no break or interruption extending continuously across the belt. The unground bases on opposite ends
 75 of the belt meet at their edges or corners leaving only small bare areas between the bases of the fingers, which areas are separated from one another and are arranged in staggered relation so that for all practical purposes a continuous abrasive surface at
 80 the joint is secured.

While the invention has been illustrated
 85 and described in its preferred form, it is to be understood that it may be embodied in other forms within the scope of the following claims.

1. A belt joint for abrasive belts comprising interlocking fingers upon contiguous
 90 ends thereof, from which fingers the abrasive has been removed, leaving the original adhesive, the fingers being overlapped upon and adhesively secured to the back of the
 95 abrasive belt.

2. A belt joint for abrasive belts comprising interlocking fingers upon contiguous
 100 ends thereof and from which the abrasive is removed, overlapped upon and secured to the back of the abrasive belt with portions of the fingers at separated points impressed into the interstices and mechanically gripping the body of the belt.

3. A belt joint for abrasive belts comprising interlocking fingers upon contiguous
 105 ends thereof, overlapped upon and adhesively secured to the back of the abrasive belt, the fingers being provided with a series of projections impressed into the interstices
 110 of the back of the belt to secure a mechanical grip between the fingers and body portion of the belt.

4. The method of joining contiguous ends of an abrasive belt which consists in forming
 115 fingers upon both ends of the belt, removing the abrasive from the fingers, interlocking the fingers, applying adhesive to the fingers and to the back of the belt, and thereafter subjecting the fingers to the pressure
 120 of a plate having projections thereon to impress portions of the fingers into the interstices of the back of the belt.

5. The method of joining contiguous ends of an abrasive belt which consists in forming
 125 fingers upon both ends of the belt, grinding off the abrasive from the fingers without removing the original adhesive, interlocking and overlapping the fingers upon the back of the belt, applying adhesive to the fingers
 130

and back of the belt, and thereafter subjecting the fingers to pressure to secure them to the back of the belt.

5 6. The method of joining contiguous ends of an abrasive belt which consists in forming fingers upon both ends of the belt, removing the abrasive from the fingers, interlocking and overlapping the fingers upon the back of the belt, applying adhesive to the fingers
10 and back of the belt, and pressing the joint between rough surfaces to cause the fingers and belt to interlock at separated points.

7. The method of joining contiguous ends

of an abrasive belt which consists in forming fingers with tapered ends and widened bases upon both ends of the belt, grinding off the abrasive material from the shanks and tapered ends of the fingers without removing it from the bases, interlocking the fingers with the unground bases on the opposite ends of the belt meeting, applying
20 adhesive to the fingers and to the back of the belt, and pressing the fingers and belt into close contact.

RUFUS W. FULLER.