Dec. 30, 1958 R. F. NORMANDIN 2,866,249

WEDGE TYPE CLAMP

Filed Aug. 7, 1956

Fig. 1.

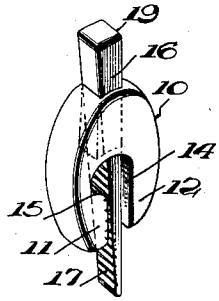


Fig. 2.

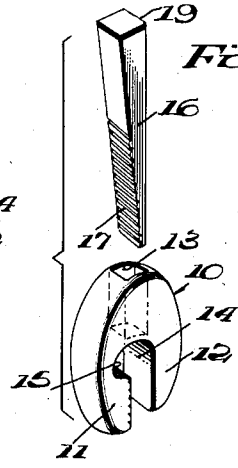


Fig. 3.

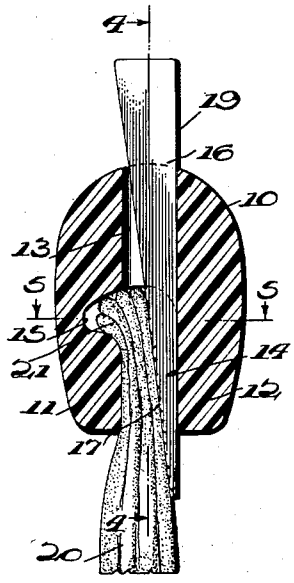


Fig. 4.

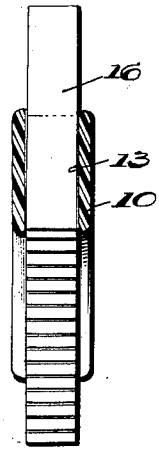


Fig. 5.

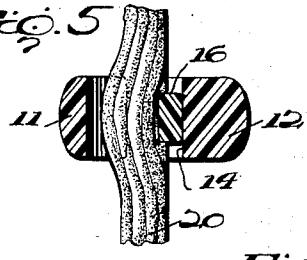


Fig. 7.

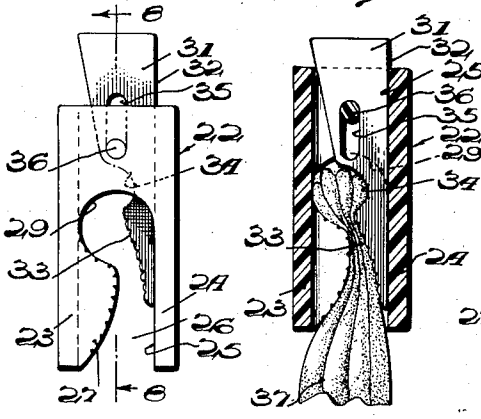


Fig. 6.

Fig. 8.

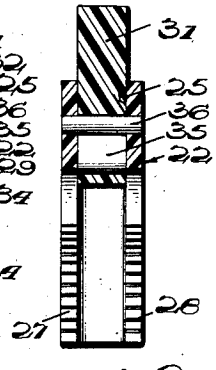
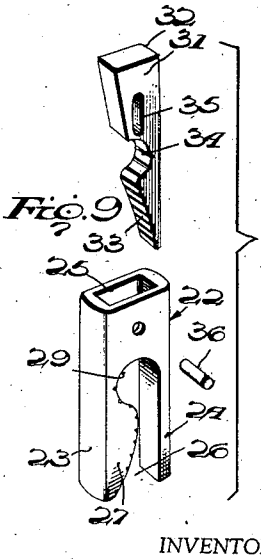


Fig. 9.



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United States Patent Office

2,866,249

Patented Dec. 30, 1958

2,866,249

WEDGE TYPE CLAMP

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Application August 7, 1956, Serial No. 602,675

6 Claims. (Cl. 24—263)

(Granted under Title 35, U. S. Code (1952), sec. 266)

The invention described herein, if patented, may be manufactured and used by or for the Government for governmental purposes, without the payment to me of any royalty thereon.

This invention relates to an improvement in clamps for releasably joining layers of cloth fabric or the like.

An important object of the invention is to provide a new and improved clamp for releasably joining layers of cloth which provides improved holding power.

A further object of the invention is to provide a new and improved clamp wherein tension on the layers of cloth clamped thereby will increase the holding power of the clamp.

A still further object of the invention is to provide a new and improved clamp in which the clamping force is generated by a wedging action between cooperating surfaces on a pair of relatively movable members in response to predetermined relative movement thereof.

Another object of the invention is to provide a new and improved quickly releasable clamp of simple construction and improved strength.

Other objects, capabilities and advantages of the invention will become apparent during the course of the following description wherein reference is had to the accompanying drawing, forming a part of this application, in which like numerals are used to designate like parts throughout the same and in which:

Figure 1 is a perspective view of a preferred embodiment of my invention,

Figure 2 is an exploded perspective view of the embodiment shown in Figure 1,

Figure 3 is a central vertical longitudinal section of the same clamp showing layers of cloth being clamped thereby,

Figure 4 is a vertical longitudinal section taken along line 4—4 of Figure 3,

Figure 5 is a norizontal transverse section taken along line 5—5 of Figure 3,

Figure 6 is a side elevation of a modification of the invention,

Figure 7 is a central vertical longitudinal section of the modification shown in Figure 6 showing layers of cloth being clamped thereby,

Figure 8 is a vertical longitudinal section taken along line 8—8 of Figure 6, and

Figure 9 is an exploded perspective view of the modification shown in Figure 6.

Referring now to the drawing wherein for the purpose of illustration, Figures 1 through 5 show a preferred embodiment of the invention, the improved clamp of the present invention comprises a generally U-shaped body 10 of plastic or like material having opposed portions or legs 11 and 12 defining an elongated recess 14 therebetween, the inner side of leg 12 preferably defining a plane surface. The body 10 has a substantially square aperture 13 extending through the same in longitudinal alignment with the recess 14 between the legs 11 and 12, one side of the aperture 13 being in alignment with the flat inner

side of leg 12 so as to provide a continuous flat surface extending from end to end of the body 10. At its base, the recess 14 has a lateral extension 15 formed in the inner side of leg 11. The surface of the lateral extension 15 as well as the inner side of leg 11 are preferably serrated or provided with any other suitable friction surface for improved gripping of the cloth or other material to be clamped together.

The aperture 13 in the clamp body forms a passageway for slidably receiving a generally wedge-shaped clamping member 16. As shown in Figure 3, the clamping member 16, in its preferred form is of generally right triangular shape in side elevation and has an inclined or tapered side 17 and a flat side or base 19, these two sides corresponding to the hypotenuse and base of a right triangle, respectively. The base 19 of this clamping member 16 bears against and is slidable upon the continuous flat surface formed by the inner side wall of leg 12 and the wall of aperture 13 aligned therewith, while the inclined side 17 along portions of its forward or leading end, is opposed to the inner surface of leg 11 so that this inclined side 17 progressively approaches the inner surface of leg 11 as the clamping member 16 is advanced in relation to the body 10. As a result, a wedging or pinching force is exerted upon the material to be held, such as the layers of cloth 20 shown in the drawing. To assist in preventing slippage of the material which is being held, the inclined side 17 may be provided with a friction surface, such as the serrations shown in the drawing.

The clamping member 16 is of sufficient thickness at its larger end to prevent the same from passing through the aperture 13 in the clamp body while permitting movement of the member into said body through substantially its entire length. In the preferred embodiment, the clamping member is approximately one and one-half times the length of the clamp body 10 but may be considerably lengthened or shortened if desired.

In the operation of the preferred embodiment of my invention, the clamping member 16 is retracted with respect to the clamp body 10 and the layers of cloth or other material 20 to be clamped are placed with their outer edges 21 registering in the recess 14 of the body. The clamping member 16 is then advanced into the body 10 thereby clamping or wedging the layers of cloth 20 against the leg 11 with increasing force as the clamping member is advanced and causing the ends of the cloth to bush or spread out into the lateral extension 15 on leg 11 so that a steady gripping action of considerable magnitude is exerted on the cloth. It will be noted that once the cloth is secured in the clamp, tension on the cloth will result in a downward force being exerted on the clamping member 16, thereby increasing the holding action of the clamp.

To release materials held by the clamp of the present invention, the clamping member 16 is simply withdrawn from the aperture 13 in the body 10 to an extent sufficient to permit the body to be removed from the materials.

Figures 6 through 9 of the drawing represent another embodiment of my invention having an elongated tubular body 22 of generally rectangular shape in transverse section and tubular in form so as to define a longitudinally extending generally rectangular aperture or slideway 25 therein. Opposed sides of the body 22 are recessed to form opposed legs 23 and 24 on the body and an elongated recess 26 between the legs. The inner side of leg 24 is flat and constitutes a continuation of one of the sides of slideway 25, as shown in Figure 7, while the inner side of leg 23 is contoured generally as shown in Figure 6 so that the width of recess 26 is gradually diminished from the forward toward the base end thereof, thus, in effect, providing inwardly extending flanges 27

and 28 on the leg 23. The base end of recess 26 includes an arcuate enlargement 29 extending laterally into leg 23. The inner edges of the flanges 27 and 28 and portions of the lateral extension 29 are provided with a friction surface such as the serrations shown in Figures 6 and 7.

A clamping member 31 is slidably mounted in the rectangular aperture or slideway 25 in the body 22. This clamping member is similar to the clamping member 16 previously described in that it has a flat back side 32 and an inclined or tapered side 33 opposed thereto which inclines increasingly from the forward or leading end of the clamping member toward the trailing end like the hypotenuse of a right triangle. However, clamping member 31 has a generally semi-circular recess 34 intermediate the ends of the inclined side 33. In addition it is to be noted that the forward and backward movement of the clamping member 31 is limited by a pin and slot connection between this member and the body 22. This connection may, for example, comprise an elongated slot 35 in the clamping member 31 and a pin 36 suitably anchored in opposite walls of the body 22 at a position to extend through slot 35. A friction surface which may comprise serrations in the recessed part 34 of clamping member 31 and the tapered side 33 forward on this recessed part may be provided as shown in Figure 7 to improve operation of the device.

In the operation of this embodiment of the present invention, the wedge-shaped member 31 is withdrawn relative to the clamp body 22 to the full extent permitted by the action of the pin 36 engaging the longitudinally extending slot 35. The layers of cloth or the like to be clamped together which are generally designated by 37 are inserted as far as possible into the recess 26 in the body 22, the edges of the cloth 37 being arranged to register one with the other. The clamping member 31 is advanced with respect to the body 22 so that its inclined side 33 progressively approaches those portions of the edges of flanges 27 and 28 which project farthest inward. As a result, the layers of cloth 37 are pressed or wedged with increasing force against these portions of the flanges and may even be pinched between the flat sides of the clamping member 31 and the inner sides of flanges 27 and 28, if only a few layers are being clamped together. This forward movement of the clamping member 31 brings the lateral recesses 29 and 34 into opposition providing a space into which the ends of the layers of cloth 37 may spread out as shown in Figure 7. By the cooperative action of the serrations on the incline 33 and flanges 27 and 28 and the recesses 29 and 34, the layers of cloth 37 are firmly gripped.

By reference to Figure 7 of the drawing, it will be seen that with the fabrics so joined by the use of this form of the invention, tension applied to the fabrics will serve to increase the holding power of the clamp in the same manner as in the previously described preferred embodiment of my invention.

The release of materials joined by my clamp is accomplished by simply withdrawing the clamping member 31 to the limit of its upward movement and removing the clamp body from the material.

It is to be understood that the forms of invention herewith shown and described are to be taken as preferred examples of the same and that various changes in the shape, size and arrangement of parts may be resorted to without departing from the spirit of the invention or the scope of the subjoined claims.

I claim:

1. A clamp comprising a body conformed to provide opposed portions defining an elongated recess therebetween, the base of said recess having a lateral extension on one side thereof, said body having an aperture defining a slideway extending through the body from the base of the recess in general alignment with the longitudinal axis of the said recess and a clamping member slidably receivable in said slideway and having at least one side thereof conformed to approach the side of said recess having said lateral extension progressively in response to predetermined relative sliding movement of the body and clamping member.

2. A clamp as defined in claim 1 wherein at least one of the cooperating sides defined by the said one side of the clamping member and the side of the said recess approached thereby is provided with a friction surface.

3. A clamp as defined in claim 1 wherein the trailing end portion of the clamping member is of greater transverse cross sectional area than the largest transverse cross sectional area of the aperture in the body.

4. A clamp as defined in claim 1 wherein the base of said recess on the side thereof approached by the said one side of said clamping member has a lateral extension and the clamping member has a recess in the said one side thereof located so as to be brought into lateral opposition to the extension on the recess in said body as said clamping member and said body are moved in the said predetermined manner.

5. A clamp comprising a body conformed to provide opposed portions defining an elongated recess therebetween, said body having an aperture defining a slideway extending through the body from the base of the recess in general alignment with the longitudinal axis of the said recess, a clamping member slidably receivable in said slideway and having at least one side thereof conformed to approach the side of said recess opposed thereto progressively in response to predetermined relative sliding movement of the body and clamping member and means for limiting relative sliding movement of said body and clamping member.

6. A clamp comprising a body having opposed portions defining an elongated recess therebetween, a least one side of said recess defining a flat plane surface, the base of said recess having a lateral extension on the side thereof opposite said flat plane surface, said body having an aperture defining a slideway extending through the body from the base of said recess, one side of said aperture comprising a flat surface lying in the same plane as the flat side of said recess so as to constitute a continuation thereof and a wedging member slidably receivable in the aperture in said body and having a flat side for slidably engaging the flat side of said recess and aperture and a side opposite said flat side conformed to approach the side of said recess opposite said flat side progressively as the wedging member is advanced in the aperture in said clamp body.

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