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SHEET CLAMPS

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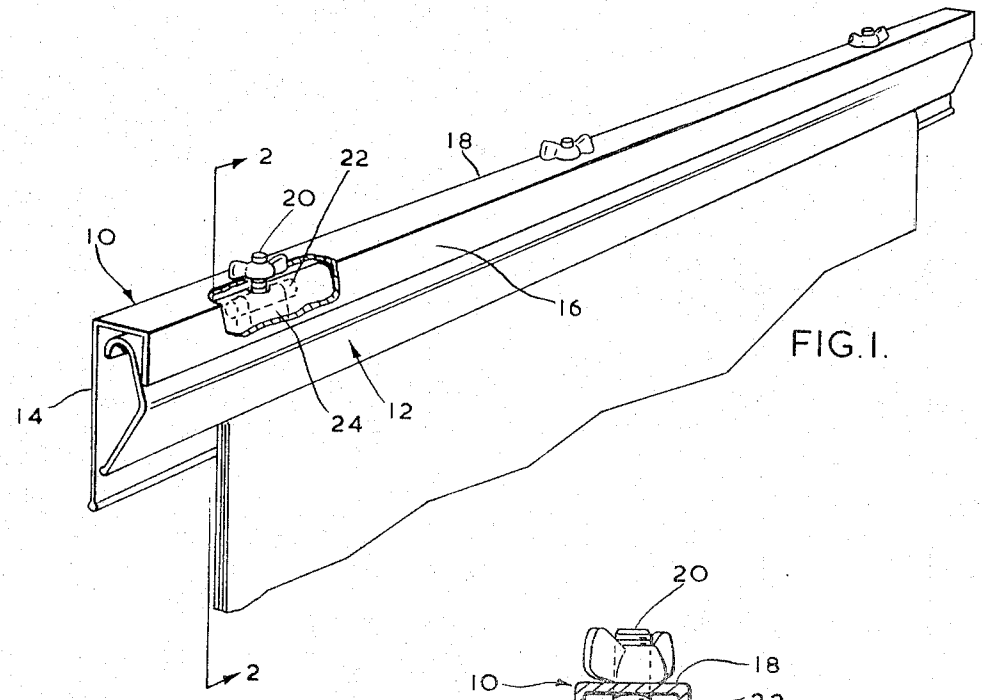


FIG. 1.

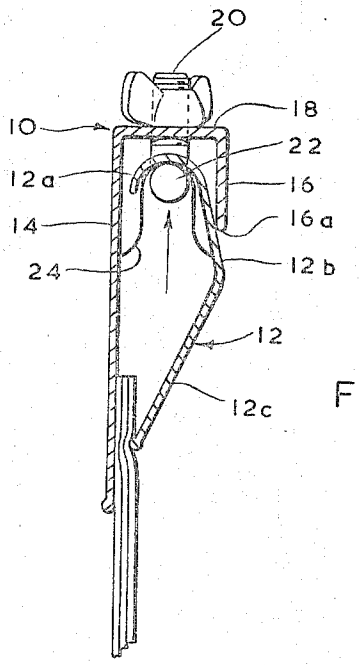


FIG. 2.

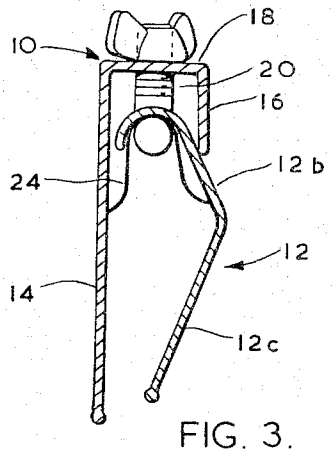


FIG. 3.

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SHEET CLAMPS

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ABSTRACT OF THE DISCLOSURE

A clamp for frictionally gripping and holding sheets along one edge. The clamp includes a channel-section member with one arm longer than the other, and a pressure applying member carried by the channel member for pressing sheets against the portion of the longer arm which extends beyond the other arm. The pressure member is movable inwardly and outwardly of the channel member, and is so supported and shaped that such movement cams the pressure member to respectively press and release the sheets.

This invention relates to clamps for holding sheets such as blueprints, maps, and the like by a friction grip and is particularly concerned with a clamp of this type which is characterized by simplicity of construction as contrasted with similar clamps heretofore available.

Where it has been desired to store large sheets such as blueprints and maps without folding the sheets, it has been the common practice to use either large drawers in which the sheets are laid flat or cabinets having a plurality of long cubbyholes in which the sheets may be stored in a rolled condition. However, a fairly recent trend in the storage of such sheets has employed specially designed racks supporting a plurality of elongated clamp means which grasp the sheets along one edge and allow the sheets to hang freely within the rack. There are several advantages to this manner of storing large sheets including the fact that gravity acts to keep the sheets in an uncurled, unwrinkled condition.

It is an object of this invention to provide an improved friction-type clamp for sheets which is characterized by simplicity of construction and relative low cost as compared with similar devices heretofore available.

It is a further object of the invention to provide a clamping device of this type in which the clamping action is effected between a portion of the main body of the clamp and a movable pressure applicator whereby only one of the components effecting the clamping action moves relative to the main body of the device.

The above and further objects of the invention will be more thoroughly understood from the following description of a preferred embodiment thereof as read in conjunction with the accompanying drawings.

In the drawings:

FIG. 1 is a perspective view, partly broken away, showing an improved clamp for sheets in accord with this preferred embodiment of the invention;

FIG. 2 is an enlarged cross-sectional view taken along the line 2—2 of FIG. 1; and

FIG. 3 is a view similar to FIG. 2 and showing the two main components of the clamp in a second relative position.

Referring to FIG. 1, the illustrated clamp essentially consists of a channel member **10** forming the main body of the clamp and a pressure applicator **12** adapted to move relative to channel member **10**. The channel member **10** is comprised of a pair of substantially parallel arms **14** and **16** connected by a transverse web **18**. Arm **14** is considerably longer than the other arm, giving the

channel member a hook-like appearance in cross-sectional shape. Channel member **10** as well as pressure applicator **12** may be made of a variety of suitable stiff materials. A preferred material would be stainless steel with both members being shaped by cold roll forming. Extruded plastic or aluminum sections might also be employed.

Pressure applicator **12** is connected to the channel member through the use of one or more T bolts which are passed through suitable holes in both the pressure applicator and the web portion **18** of the channel member. Wing nuts are engaged on the bolts whereby to provide means for drawing the pressure applicator more deeply into the channel portion of member **10** and it is this drawing inward action which effects the pivoting of pressure applicator **12** relative to the channel member **10**, as is explained in more detail hereinafter.

It should be noted that while pressure applicator **12** is made of one piece of material, it essentially consists of three parts, namely a curved top portion **12***a*, a first sloped portion **12***b* and an angularly related second sloped portion **12***c*. The curved portion **12***a* acts as a hook member which is engaged by the short bar-like heads **22** of the T bolts **20**. Portion **12***a* also helps to keep the heads of the T bolts longitudinally aligned with the channel member **10**. The holes in curved portion **12***a* through which the T bolts are passed are sufficiently large to allow a certain amount of loose play whereby the pressure applicator is capable of pivoting relative to the channel member **10**. In this regard, it should be understood that the particular manner illustrated for effecting connection between the pressure applicator and the channel member is a preferred expedient characterized by simplicity while the function of the pressure applicator can be otherwise achieved provided such interconnection is a pivotal connection. Thus, for example, the upper end of portion **12***b* of the pressure applicator could be provided with female hinge components adapted to cooperate with the cross pieces of the T bolts in the manner of a hinge.

As will be readily apparent from FIG. 2, the lower portion **12***c* of the pressure applicator is swung inwardly to assert pressure through the sheets against the inside face of the longer arm **14** of the channel member when the wing nuts are tightened as to draw the T bolts upwardly, as shown in FIG. 2, whereby the sloped portion **12***b* of the pressure applicator engages the lower free edge **16***a* of the shorter arm **16**. Similarly, the pressure applicator is released from the position shown in FIG. 2 by unscrewing the wing nuts to drop the cross pieces of the T bolts downwardly whereby the leaf springs **24** cause the lower portion **12***c* of the pressure applicator to swing outwardly away from the longer arm **14**. FIG. 3 shows the relative position of the two main components making up the clamp of the invention when the clamp has been loosened.

It is the principle of forming the arm **14** of the channel member longer than the other arm **16** which characterizes the clamp of this invention and distinguishes it from the clamps known heretofore. By this arrangement, it is possible to use a portion, arm **14**, of the channel member itself as one of the clamping components, that is, a fixed stationary enlarged flat internal surface is available as a support surface for edge margins of the sheets. Another portion of the same channel member, that is, free edge **16***a* of arm **16**, serves as a means opposite the support surface and fixed relative to arm **14** to cooperate with the first sloped portion **12***b* of the pressure applicator to cam the second sloped portion **12***c* of the pressure applicator toward the arm **14**. Apart from simplicity of construction and relative lesser manufactur-

ing cost, the clamp of the present invention has the added advantage that sheets may be more easily placed within the clamp by laying the longer arm 14 of the clamp on a table or the like whereby the arms acts as a guide when sliding the sheets towards the upper end of the clamp.

What I claim as my invention is:

1. A clamp for holding one or more sheets by a friction grip comprising an elongated channel member having a pair of substantially parallel arms connected by a transverse web, one of said arms being longer than the other whereby said channel member is hook-like in cross-sectional shape, and a pressure applicator carried by said channel member and adapted to exert pressure through one or more sheets against the inner face of that portion of said longer arm which extends beyond the shorter arm whereby to hold one or more sheets between said pressure applicator and said longer arm, said pressure applicator being slidably movable relative to said channel member toward and away from said web, said applicator being suitably shaped and supported so as to be cammed against the free marginal portion of the shorter arm by said movement to vary said pressure.

2. A clamp for holding one or more sheets by a friction grip comprising an elongated channel member having a pair of substantially parallel arms connected by a transverse web, one of said arms being longer than the other whereby said channel member is hook-like in cross-sectional shape, and a pressure applicator carried by said channel member and adapted to exert pressure through one or more sheets against the inner face of that portion of said longer arm which extends beyond the shorter arm, whereby to hold one or more sheets between said pressure applicator and said longer arm, said pressure applicator including an inner portion received within the channel portion of said channel member and an outer portion which bears against said inner face of said longer arm through one or more sheets when the clamp is tightened, said clamp further including means for drawing said pressure applicator towards the web of said channel member, and pivot means interconnecting the inner portion of said pressure applicator with said drawing means, said pressure applicator including a cam surface postioned between said inner and outer portions thereof and contacting the outer free edge of said shorter arm, said cam surface being so shaped to cooperate with the outer free edge of said shorter arm to move the outer portion of said pressure applicator towards the inner surface of said longer arm as said pressure applicator is drawn towards the web of said channel member.

3. A clamp as claimed in claim 2, in which said drawing means, said pressure applicator including a cam surface through an over-size hole in the inner portion of said pressure applicator and a hole in said web and a nut carried on the bolt on the opposite side of the web from the pressure applicator, said pivot means interconnecting the inner portion of the pressure applicator and the drawing means consisting of a cross-bar on the inner end of the bolt and a hook portion carried by the inner portion of the pressure applicator with said hook portion being engaged on said cross-bar.

4. A clamp as claimed in claim 3, including leaf spring means engaged on the cross-bar of said bolt between said cross-bar and the hook portion of the inner portion of the pressure applicator and adapted to resiliently urge said cam surface of the pressure applicator away from said longer arm as said drawing means is operated in reverse whereby to also urge the outer portion of said pressure applicator away from said outer arm.

5. A clamp for holding one or more sheets by a friction grip comprising an elongated channel member having a pair of substantially parallel arms connected by a transverse web, one of said arms being longer than the other whereby said channel member is hook-like in cross-sectional shape, and a single elongated pressure applying member carried by said channel member and adapted to exert pressure through one or more sheets against the inner face of the portion of said longer arm which extends beyond the shorter arm, thereby to hold one or more sheets between said pressure applying member and said longer arm, said pressure applying member including an inner portion received within said channel member and an outer portion for bearing against said inner face of said longer arm through one or more said sheets, said clamp further including means between said inner portion and said web to slidably move said pressure applying member relative to said channel member to vary said pressure, said pressure applying member having a surface in wedging contact with an edge margin of said shorter arm, and spring means for biasing said surface on the pressure applying member into said wedging contact with the shorter arm.

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