Nov. 7, 1967 R. J. BALLENGER ET AL 3,350,754

FLEXIBLE CLOTHING CLAMP STRUCTURE

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Fig. 1

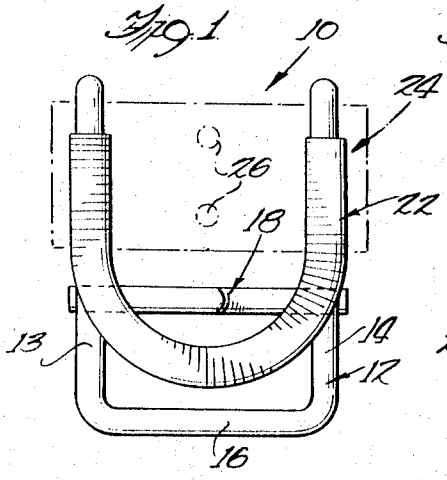


Fig. 2

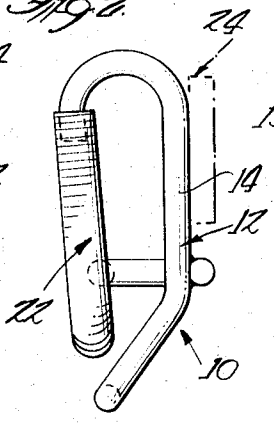


Fig. 3

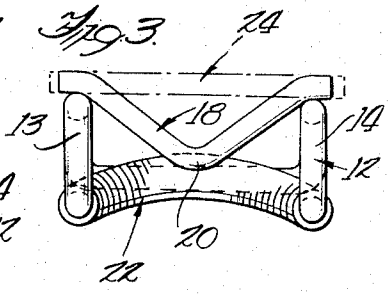


Fig. 4

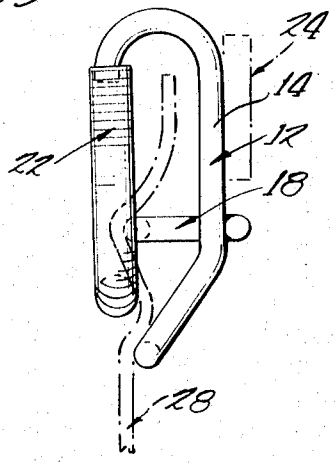


Fig. 5

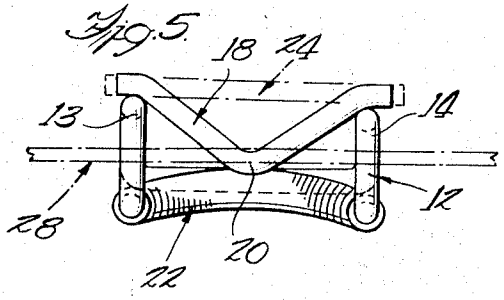


Fig. 6

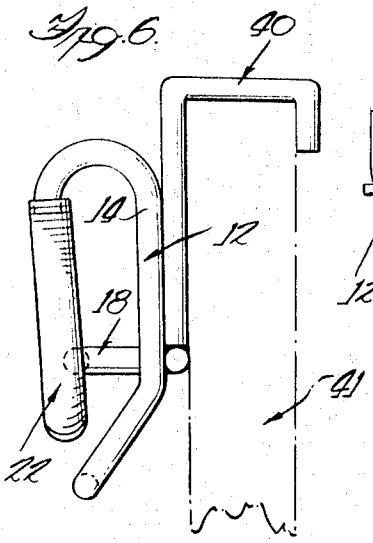
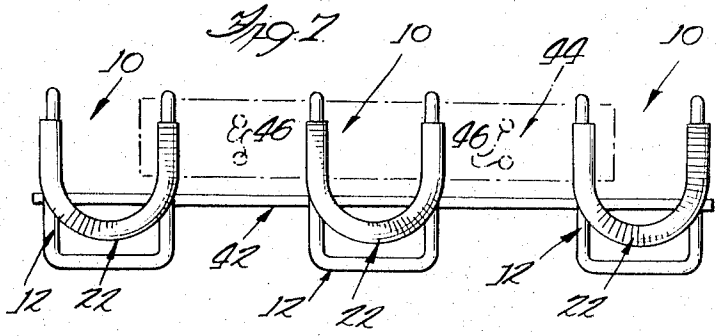


Fig. 7



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Fig. 8

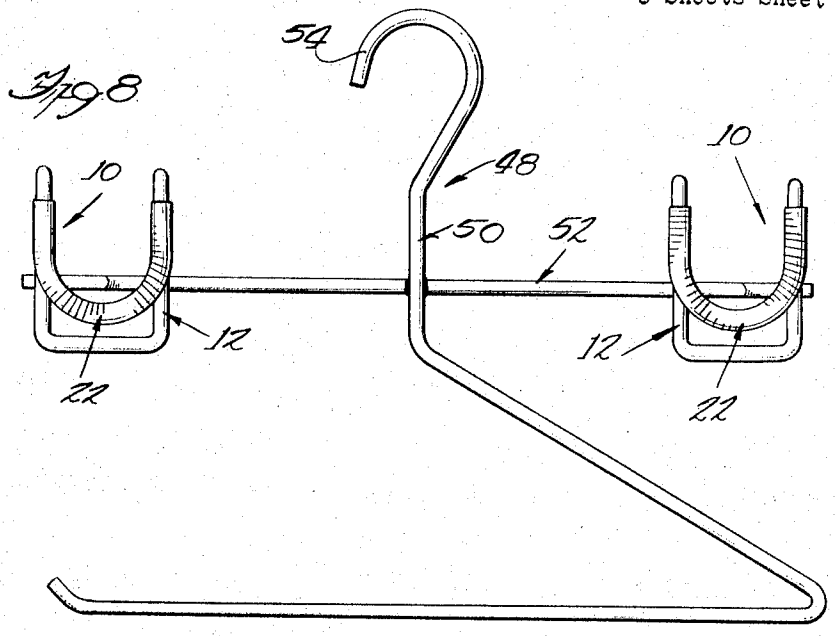


Fig. 11

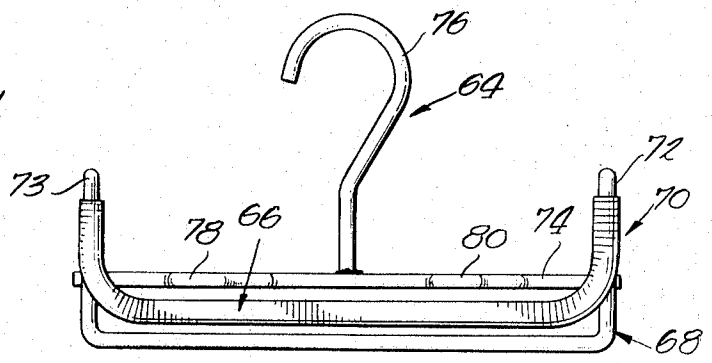
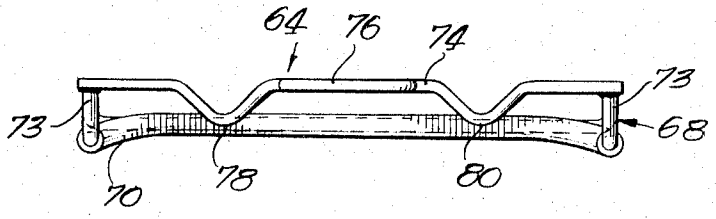


Fig. 12



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Fig. 9

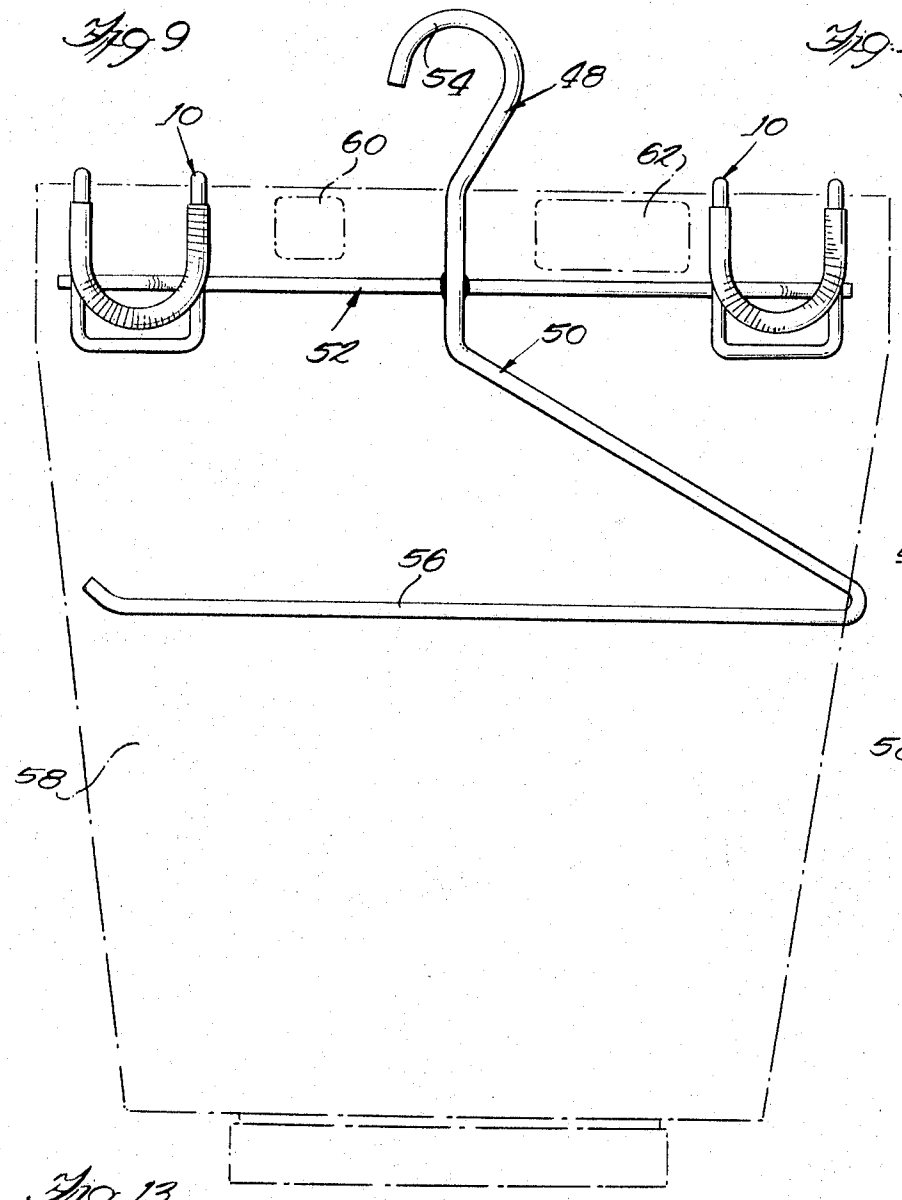


Fig. 10.

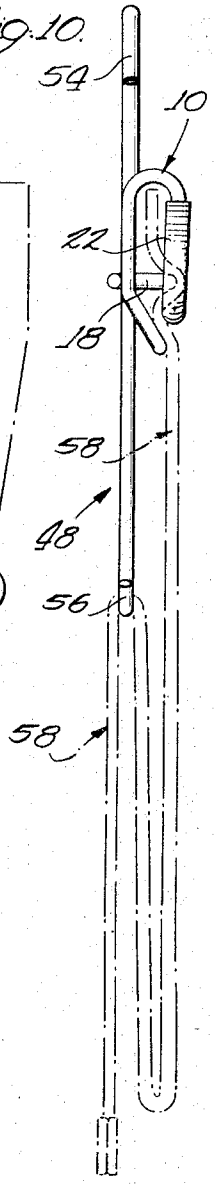


Fig. 13

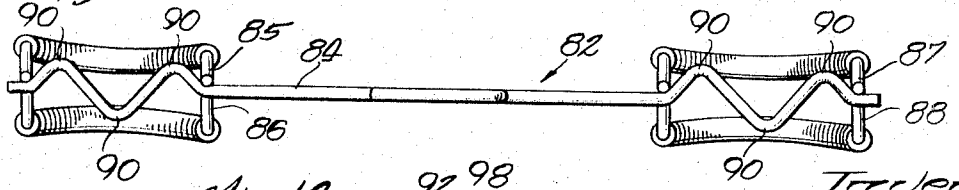
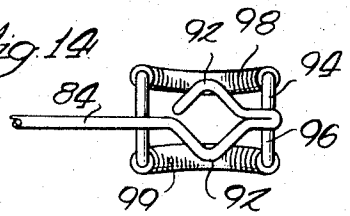


Fig. 14



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FLEXIBLE CLOTHING CLAMP STRUCTURE

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22 Claims. (Cl. 24—255)

This invention relates generally to clamp structures and more particularly to clamp structures which are particularly adapted to clampingly engage and thereby retain substantially flexible material, particularly fabric.

The clamp of the present invention generally can be used with any type of material, however, it is particularly adapted and is primarily intended for use to clampingly engage and thereby retain substantially flexible sheet material. In particular, the clamp can be advantageously used to hold fabric and clothing. It is in this latter respect that the clamp is superior to those presently available, for it may be used repeatedly without losing its resiliency and clothing can be supported by the clamp for a considerable period of time with generally little, if any, creasing. Accordingly, one or more of the clamps can be adapted to a hanger for storing or transporting clothing, particularly men's trousers.

It is therefore an object of the present invention to provide an improved clamp. More particularly, it is an object to provide an improved clamp which is adapted to clampingly engage and thereby retain substantially flexible sheet material, such as fabric and clothing.

Another object is to provide an improved clamp for supporting a substantially flexible sheet material such as fabric and clothing in a fashion such that little, if any creasing results.

Still another object is to provide a clamp of the described type which may be used repeatedly over a considerable period of time with little, if any, loss in its resiliency and hence clamping action.

Still another object is to provide a clamp of the described type which is adaptable to be mounted to a flat surface or it may have a bracket affixed to it for removably affixing the clamp to a door by hooking the bracket over the top edge of the door or it may be formed as an integral part of a clothes hanger which is adapted to be hung on a clothes pole within a clothes closet and the like.

A still further object is to provide a clamp which is simple in construction, having no moving parts.

A still further object is to provide an improved clothes hanger having as an integral part thereof at least one clamp of the above-described type.

Still another object is to provide an improved hanger having two pairs of clamps of the above-described type formed as an integral part thereof so that two articles of clothing, such as two pairs of men's trousers, can be supported by it.

Still another object is to provide an improved hanger having clamps of the above-described type formed as an integral part of it, and having a hook-like member whereby an article of clothing, such as a pair of men's trousers can be supported by the clamps and the trouser legs draped over the hook-like member so as to substantially reduce the space required to store the trousers. In this respect, the hanger is also particularly adapted for use in a suitcase for transporting articles of clothing, such as men's trousers.

Other objects of the invention will in part be obvious and will in part appear hereinafter.

The invention accordingly comprises the features of construction, combination of elements, and arrangement of parts which will be exemplified in the construction

hereinafter set forth, and the scope of the invention will be indicated in the claims.

For a fuller understanding of the nature and objects of the invention, reference should be had to the following detailed description taken in connection with the accompanying drawings in which:

FIG. 1 is a front plan view of a clamp exemplary of the invention;

FIG. 2 is a side plan view of the clamp of FIG. 1;

FIG. 3 is a top plan view of the clamp of FIG. 1;

FIGS. 4 and 5 are side and top plan views, respectively, of the clamp of FIG. 1 illustrating the manner in which a flexible sheet material is clampingly engaged and thereby retained by the clamp;

FIG. 6 is a side plan view illustrating the clamp of FIG. 1 having a substantially U-shaped door bracket affixed to it to adapt the clamp for mounting to a door;

FIG. 7 is a front plan view illustrating one manner in which a number of the clamps of FIG. 1 can be adapted for mounting to a flat surface and the like;

FIG. 8 is a front plan view of a hanger exemplary of the invention, having a pair of clamps of the type illustrated in FIG. 1 formed as an integral part thereof;

FIGS. 9 and 10 are front and side plan views, respectively, of the hanger of FIG. 8, illustrating the manner in which a pair of men's trousers can be supported on the hanger;

FIGS. 11 and 12 are front and top plan views, respectively, illustrating a hanger having an enlarged clamp of the type illustrated in FIG. 1 integrally formed as a part thereof;

FIG. 13 is a top plan view illustrating a manner in which a hanger can be formed with two pairs of clamps of the type illustrated in FIG. 1, as an integral part thereof; and

FIG. 14 is a partial top plan view of one end of the hanger, illustrating an alternative manner in which the end of the locking bar can be formed to provide the locking tips.

Similar reference characters refer to similar parts throughout the several views of the drawings.

Referring now to the drawings, in FIG. 1 there is illustrated a clamp **10** exemplary of the invention having a clamp body **12** formed of a substantially U-shaped rod which has the ends of its two arms **13** and **14** reversely folded so that each of the arms, when viewed from the side, as illustrated in FIG. 2, generally resemble an inverted J. The loop portion **16** of the clamp body **12** between the arms **13** and **14** is preferably bent to extend angularly outward towards the ends of the arms **13** and **14**, in a manner described more fully hereinafter. A locking bar **18** which comprises a rod which is bent to form a substantially pointed tip **20** and which has its opposite ends affixed to respective one of the arms **13** and **14** in a fashion such that the tip **20** is centrally disposed between the two arms. The locking bar **18** may be affixed to the backside of the arms **13** and **14**, as illustrated, or alternatively, it can be affixed to the front side of them. A coil spring **22** has its ends secured to the ends of the arms **13** and **14** and is of a length so that it forms a loop which extends, preferably to a point just slightly above the loop portion **16** of the clamp body **12**. The inside diameter of the coil spring **22** advantageously corresponds to the outer diameter of the rod forming the clamp body **12** so that the ends of the coil spring **22** can be secured to the ends of the arms **13** and **14** by forcibly and frictionally urging them on to the ends. The tip **20** of the locking bar **18** preferably projects between the loop of the coil spring **22** or to a point just behind the coil spring **22**, and the downwardly disposed ends of the arms **13** and **14** are bent slightly inwardly so that the coil spring is slightly

angularly disposed with respect to the vertical axis of the clamp **10**.

A plate **24** having a pair of apertures **26** (shown in dotted lines in FIGS. 1–3) can be fixedly secured between the arms **13** and **14** for affixing the clamp **10** to a flat surface, by extending fastening means such as threaded screws through the apertures **26**.

To use the clamp **10**, the coil spring **22** is flexed or bent outwardly away from the clamp body **12** and the object to be clamped, such as the flexible sheet material **28**, is placed behind the clamp against the tip **20** of the locking bar **18**, as illustrated in FIGS. 4 and 5, and the coil spring **22** released. It can be seen that the coil spring **22** forcibly urges the sheet material **28** about the pointed tip **20** of the locking bar **18** so as to effectively lock the sheet material between the coil spring **22** and the arms **13** and **14** of the clamp body **12**. Also, the looped end of the coil spring **22** engages and forcibly urges the sheet material **28** inwardly above the loop portion **16** and between the arms **13** and **14** of the clamp body **12** so that the sheet material generally drapes over the loop portion **16**. It is found that the action of the coil spring **22** is effective to securely clamp the sheet material so that considerable effort is required to release the material, without releasing the tension of the coil spring. Furthermore, while the sheet material is firmly clamped and retained, the clamp causes very little, if any, creasing of the material, even after the material is clamped therein for considerable periods of time.

To further increase the effectiveness of the clamp in retaining objects clamped therein, the entire clamp is preferably coated with rubber or a similar material to provide greater frictional engagement with the object so that greater resistance is provided against the object being released. This coating may be advantageously applied by dipping the clamp, and, accordingly, the looped end of the coil spring **22** is preferably spaced from the loop portion **16** of the clamp body **12**, as indicated above, so that the coating does not overrun and adhere the coil spring to the clamp body. A jet of air can advantageously be applied across the clamp at this point, after the dipping operation to virtually eliminate any possibility of this occurring. The coating applied to the clamp also functions to effectively seal and therefore fixedly secure the ends of the coil spring to the arms **13** and **14** so that under normal circumstances or use, the possibility of the ends of the coil spring coming loose from the arms is virtually eliminated. A coating, such as rubber, is particularly desirable to provide secure clamping and retainment of glossy or similar type objects or material which offers, very little, if any, resistance to another object slidingly or clampingly engaged therewith.

The use of a coil spring is generally unique in an application of the above-described type inasmuch as coil springs are generally intended and used in applications wherein the coil spring is stretched longitudinally. Normally in such an application, a torsion spring would be used. However, it is found that the coil spring is extremely effective and is virtually immune to damage. When the coil spring **22** is bent to permit an object to be clamped beneath it, each of its coils flex and is "working" so that its tensional forces resisting the bending action is generally distributed throughout the length of the coil spring. This factor is particularly significant, particularly at the ends affixed to the arms **13** and **14**, since it permits the spring to be repeatedly bent without breakage occurring at these connecting points. In attempting to use a torsion spring, it is found that the springs fail at these points after the spring is bent a relatively few times. Also, this same factor permits the coil spring to retain its resiliency and therefore its clamping ability indefinitely.

In FIG. 6, the clamp **10** is illustrated affixed to a substantially U-shaped bracket **40** which is adapted to be hooked over the upper edge of a door **41** and the like. The bracket **40** can have a width which substantially corresponds to the width of the plate **24**, illustrated in FIG. 1, so as to provide a hook which will securely engage with the door. With this construction, it can be seen that the clamp **10** can be used in bedrooms or bathrooms to conveniently hang articles of clothing or towels and the like. In FIG. 7, a bar **42** is illustrated having a number of clamps **10** affixed to it and a plate **44** having apertures **46** therein for fixedly mounting the bracket unit to a flat surface and the like. In this case, the bar **42** can be bent to provide tips which correspond to the tip **20** illustrated in FIGS. 1–3 and the clamp body is affixed to the rod so that the tips project between the loop of the springs, in the manner described above. Individual articles can be retained by respective ones of the clamps or the article can be retained by means of all of the clamps, simultaneously.

In FIG. 8 there is illustrated a hanger **48** including a rod **50** which is affixed to another rod **52** and which has its one end bent to provide a hood **54** which is adapted to hang over a clothes bar and the like. The opposite end of the rod **50** extends perpendicularly to the bar **52** a short distance below the bar **52** and is then angularly disposed at an angle of approximately 30° and then again reversely bent to extend parallel with the bar **52**. The pair of clamps **10** are affixed to the opposite ends of the bar **52**, and the bar **52** is bent to provide a pair of tips corresponding to the tips **20** of the locking bar **18**. As described above, the body portions **12** of the clamps **10** are affixed to the bar **52** so that the tips project between the loop portion of the coil spring **22**, in the manner described above.

The hanger **48** can be advantageously used to hang a pair of men's trousers, in the manner illustrated in FIGS. 9 and 10. In these figs., it can be seen that the top of the trousers **58** are clampingly engaged by means of the clamp **10**, in the manner described above, and the pant legs of the trousers can be folded and draped over the horizontally disposed end **56** of the rod **50**. The hanger **48** is ideally suited for hanging trousers in a closet, for the trousers are securely retained on the hanger by means of the clamps **10** so that there is very little likelihood of them becoming unhooked from the hanger and, furthermore, since the pant legs are folded and draped over the horizontally disposed end **56** thereof, the pant trousers require no more room than a pair of shorts. This feature also permits trousers to be suspended on clothes bars which are disposed in vertical, spaced relationship, one on top of the other. For the same reason, the hanger **48** is ideally suited for use in conjunction with a suitcase since the pant trousers can be compactly folded and secured on the hanger, within the suitcase.

The hanger **48** is also ideally suited for use in department stores for displaying men's trousers, for the trousers are securely clamped and held by the clamps **10** thereon and require little storage space since the trouser legs can be folded and draped over the horizontally disposed end **56** of the bar **50**. Since the hanger is adapted to clampingly engage the top end of the trousers, labels **60** and **62** indicating the price, size and like information concerning the trousers are disposed so that they can be easily read and observed by anyone interested in purchasing the trousers. Also, the fact that the trousers can be clampingly engaged by the clamps for a considerable period of time without being creased adds considerable value to their use for this purpose.

The hanger **48** can also be coated with rubber or similar material, in the manner described above, to offer greater frictional surfaces and hence resistance to the trousers accidentally being removed.

A hanger **64** is illustrated in FIGS. 11 and 12 which has a clamp **66** formed as an integral part of it and which is adapted to hang larger articles or to, for example, hang a pair of men's trousers by the pant cuffs rather than the top of the trousers, as in the case of the hanger **48** illustrated

in FIGS. 9 and 10. The clamp **66** is like the clamp **10** illustrated above, however, the clamp body **68** is substantially larger in width than the clamp body **12** and the coil spring **70** is correspondingly lengthened to provide a loop when affixed to the ends of the arms **72** and **73** of the clamp body **68**. The clamp body **68** is fixedly secured to a rod **74** which functions as a locking bar and also the support member for the hook **76** affixed to it. Since the clamp body **68** is substantially wider in width, the locking bar **74** preferably has offset bends formed in it to provide a pair of tips **78** and **80** which are disposed with respect to the coil spring **70** and the lower portion of the clamp body **68**, in the manner described above. With this construction, it can be seen that larger articles and particularly the cuff portion of men's trousers can be clampingly secured to the hanger **64**.

In FIG. 13, there is illustrated a hanger **82** which may be like hanger **48** illustrated in FIG. 8, however, the hanger **82** has a pair of clamps affixed to each of its two opposite sides so that, for example, two pair of men's trousers can be hung on the hanger. In the case of the hanger **82**, a bar **84** has each of its ends bent to function in the manner of the locking bar **18** of the clamp **10** and the clamp bodies **85–88** are fixedly secured to the bar **84** in alignment with the tips **90** formed therein. It may be noted that the bar **84** is bent in a fashion such that on each of its opposite ends a pair of tips **90** are formed to extend on one side of the bar **84** while only a single tip **90** extends on the opposite side thereof. In FIG. 14 there is illustrated an alternative manner in which the ends of the bar **84** may be formed to provide two centrally disposed, oppositely extending tips **92**. In this case, the ends of the rod **84** are reversely folded and bent so as to provide the tips **92** and the clamp bodies **94** and **96** are fixedly secured to the rod **84** so that the tips **92** are disposed with respect to the coil springs **98** and **99** in the manner described above.

It will thus be seen that the objects set forth above, among those made apparent from the preceding description, are efficiently attained and, since certain changes may be made in the above construction without departing from the scope of the invention, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

It is also to be understood that the following claims are intended to cover all of the generic and specific features of the invention herein described, and all statements of the scope of the invention, which, as a matter of language, might be said to fall therebetween.

Now that the invention has been described, what is claimed is:

1. A clamp for retaining material such as fabric, articles of clothing and the like comprising: a clamp body which is generally U-shaped and having arms which when viewed from the side generally resemble an inverted J; a flexible bendable clamping member having its ends affixed to respective ones of said arms and of a length so as to form a loop; and a locking bar having at least one offset substantially pointed tip formed therein affixed to sail clamp body and positioned so that said tip projects substantially between said loop of said clamping member.

2. The clamp of claim **1** wherein said clamping member comprises a coil spring.

3. The clamp of claim **2** wherein the connecting portion of said clamp body between its arms is bent so as to be angularly disposed substantially beneath and in spaced relation to the loop of said coil spring.

4. The clamp of claim **2** wherein the loop in said coil spring extends to a position below said locking bar and above said connecting portion of said clamp body.

5. The clamp of claim **2** wherein the ends of said arms of said clamp body are bent so that said coil spring is angularly disposed with respect to said arms and the lower portion of the loop therein is substantially positioned between said locking bar and the connecting portion between said arms of said clamp body.

6. The clamp of claim **2** further including a coating of resilient frictional material thereon.

7. The clamp of claim **2** further including mounting means affixed thereto for mounting said clamp.

8. The clamp of claim **7** wherein said mounting means comprises a plate member having apertures therein for receiving fastening means for fixedly securing said clamps to a support surface.

9. The clamp of claim **7** wherein said mounting means comprises a bracket adapted to engage the edge of a door and the like for removably mounting said clamp.

10. The clamp of claim **7** wherein said mounting means comprises a hook-like member for hooking said clamp to a clothes bar and the like.

11. The clamp of claim **1** further including at least a second clamp body of like construction affixed to said locking bar, a second flexible bendable clamping member having its end affixed to respective ones of the arms of said second clamp body and of a length so as to form a loop, said locking bar having a second offset substantially pointed top formed therein, said second clamp body being affixed to said locking bar in a fashion such that said second tip projects substantially between said loop of said second clamping member.

12. The clamp of claim **11** wherein said first and second clamp bodies are each affixed to opposite sides of said locking bar in a back-to-back relationship.

13. The clamp of claim **11** wherein said locking bar is elongated in length and said first and second clamp bodies are affixed thereto in spaced relation.

14. The clamp of claim **13** further including a hook-like member affixed to said locking bar for hooking said clamp to a clothes bar and the like.

15. The clamp of claim **13** further including a rod affixed to said locking bar, one end of said rod being bent to form a hook for hooking said clamp to a clothes bar and the like and the other end of said bar being bent to form a substantially triangular-shaped support which is open on one side, whereby material can be clampingly engaged and retained at one end and the other end thereof folded and draped over said support.

16. A hanger for hanging material and clothing such as men's trousers and the like comprising: a pair of clamp bodies each generally U-shaped and having arms which when viewed from the side generally resemble an inverted J; a pair of flexible bendable clamping members each having its ends affixed to respective ones of said bodies and of a length to form a loop; a locking bar having a pair of spaced offset substantially pointed tips formed therein, said pair of clamp bodies being affixed to said locking bar and positioned so that said tips project substantially between respective ones of said loops of said clamping members; and a hook-like member affixed to said locking bar for hooking said hanger to a clothes bar and the like.

17. The hanger of claim **16** wherein said clamping members each comprise a coil spring.

18. The hanger of claim **17** further having a coating of friction material thereon.

19. The hanger of claim **17** wherein the connecting portion of each of said clamp bodies is bent so as to be angularly disposed substantially beneath and in spaced relation to the loop of said coil spring.

20. The hanger of claim **17** wherein the ends of the arms of each of said clamp bodies are bent so that said coil spring is angularly disposed with respect to said arms and the lower portion of the loop therein is substantially positioned between said locking bar and the connecting portion between said clamp body.

21. The hanger of claim **17** further including a second pair of clamp bodies and coil springs, each assembled in like fashion as said first pair of clamp bodies and coil springs, said second pair being affixed to the opposite side of said locking bar, whereby material and clothing can

be hung on both sides of said hanger, said locking bar being formed with another pair of offset substantially pointed tips and said second pair of clamp bodies being affixed thereto in like fashion as said first pair of clamp bodies.

22. The hanger of claim **21** wherein said clamp bodies are affixed to said locking bar in a back-to-back relation.

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