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Nelson

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[54] **FASTENING DEVICE FOR HINGEDLY ASSEMBLING MEMBERS**

[75] Inventor: **Charles W. Nelson**, Louisville, Ky.

[73] Assignee: **General Electric Company**, Louisville, Ky.

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[51] Int. Cl.[2] **E05D 1/06**; A47F 5/00

[58] Field of Search ..... 16/128 R, 150, 184, 187, 16/159, 172; 248/27, 300, 316 D, 343; 24/73 A, 73 B, 84 B

[56] **References Cited**

UNITED STATES PATENTS

2,811,328	10/1957	Ericson	248/27
2,909,803	10/1959	Solheim	16/159
3,204,288	9/1965	Adams	16/172
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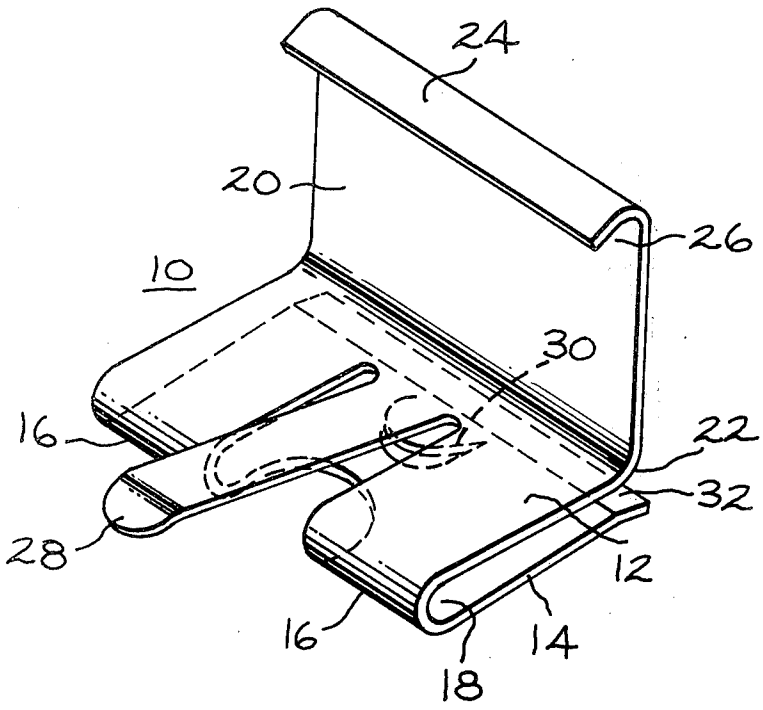
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Primary Examiner—Patrick D. Lawson

[57] **ABSTRACT**

A fastening device is provided for connecting a pair of members in hingedly assembled relationship. Means are provided for securing the device to at least one of the members being joined in hinged relationship, and means are provided for engagement with an aperture in the other of the members such that one member may be disengaged from the other or if desired may be hingedly rotated about the other member. A resilient tongue provides spring loading for tight rattle-free connection between the members.

6 Claims, 2 Drawing Figures



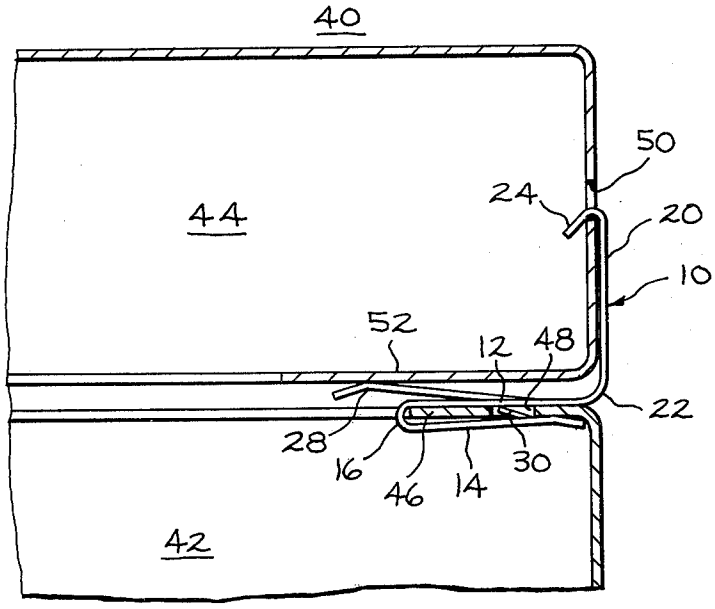

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FIG. 2

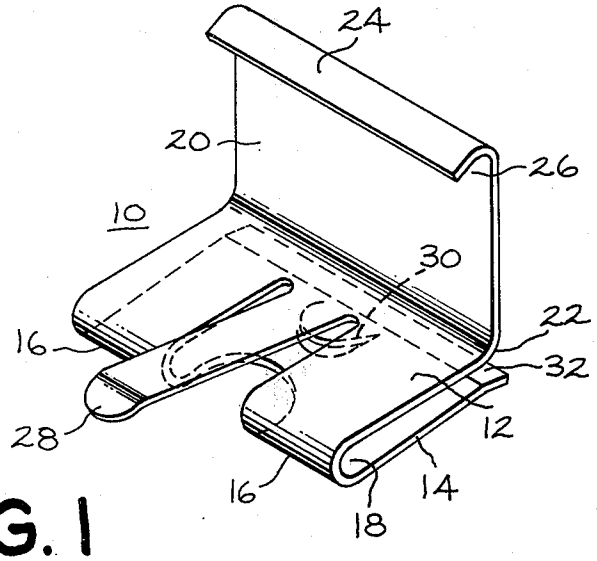

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FIG. 1

FASTENING DEVICE FOR HINGEDLY ASSEMBLING MEMBERS

BACKGROUND OF THE INVENTION

1. Field of the Invention:

The present invention relates to a fastening device for connecting a pair of members in assembled relationship and more particularly, to such a fastening device for connecting a pair of members in a hingedly assembled relationship such that a first of the members may be rotated with respect to the other member about the fastening device.

2. Description of the Prior Art:

Of the many applications wherein it is desirable that one member be secured to another member in a hinged relationship with respect thereto, there is included an application, such as in a domestic clothes dryer, whereby the top portion of the outer cabinet thereof is secured to the bottom or base portion of the cabinet. Often however, there arises the need for raising the top for gaining access to the interior of the cabinet of the dryer wherein the operating components are located. In such an application it is desirable that the top of the dryer be hingedly attached to the base portion since the top is not easily removed therefrom because of electrical wiring. in addition however to being hingedly attached, in case the need for replacement arises, it is necessary that the top be easily removed from its engagement with the base portion and be easily assembled again.

There is need then for a fastening device for securing the top of the dryer cabinet to the base portion with ease of assembly while at the same time allowing secure hinged movement of the top with respect to the base portion and further allowing the disengagement of the top from the base portion when necessary.

While the prior art has disclosed many and varied forms of anchoring and retaining fasteners, they generally do not allow for hinged movement of one element with respect to the other. In U.S. Pat. No. 2,811,328 - Ericson, there is shown a fastener intended to be used in pairs and intended to be placed in positions opposite one another. Such a fastener is not provided with means, however, for allowing hinged movement of members being connected or for securing itself to a mounting or base structure and in fact, this is not necessary since as shown therein, the article to be clamped in place serves to maintain the retainer clips in a secured relation with a mounting or panel member. U.S. Pat. No. 3,371,900 - Jacobs discloses a fastener for securing a lighting fixture to the T-bar of a grid type ceiling structure. There is however no provision for hinged movement of either element and in fact the elements are held together in secured engagement by the force of gravity. And U.S. Pat. No. 3,613,177 - Davis discloses an anchoring fastener for use in mounting a drop-in appliance within an opening in a counter top but provides for no hinged movement of such an appliance.

There is need therefore for a fastening device for connecting a pair of members in hingedly assembled relationship and wherein the fastening device remains secured to one of the members about which the other member is hingedly movable. Moreover, it is desirable that such a device may be secured without additional securing means such as rivets, screws, etc.

By the present invention, there is provided an improved fastening device for connecting a pair of members, such as the top and base portion of a domestic clothes dryer cabinet, in hingedly assembled relationship. The fastening device of the present invention is provided with means for securing itself to one of the members such as the base of the clothes dryer cabinet and is further provided with means for allowing the removal of the top of the dryer cabinet from assembled engagement with the base portion of the dryer cabinet and further for allowing rotational movement of the top portion with respect to the base portion about the fastening device, while at the same time being of simple and economical construction.

SUMMARY OF THE INVENTION

In accordance with the present invention, there is provided a fastening device for connecting a pair of members in hingedly assembled relationship. Included is a pair of spaced legs interconnected at adjacent ends to define a generally U-shaped section for receiving a portion of a first of the members to be connected. A third leg is interconnected with a first of the spaced legs at a free end thereof to form substantially a right angle therebetween, the third leg including an inwardly-extending section formed on a free end thereof to engage an aperture in a second of the members to be connected for allowing hinged movement of the second member with respect to the first member. A resilient tongue is associated with one of the spaced legs for engagement with the second member to provide a tight connection between the fastening device and the second member. Means are provided associated with one of the spaced legs for engagement with the first member for securing the fastening device to the first member.

It is an object of the present invention to provide an improved fastening device for connecting a pair of members in hingedly assembled relationship.

It is a further object to provide a fastening device for hingedly securing a pair of members in assembled relationship, the device being provided with means for securing itself to at least one of the members without need for auxiliary fastening means such as screws, rivets or the like.

BRIEF DESCRIPTION OF THE DRAWINGS

In the accompanying drawings:

FIG. **1** is a perspective view of the preferred embodiment of the fastening device of the present invention; and

FIG. **2** is a side elevational view of a domestic clothes dryer cabinet partly in section and broken away to show an application of the fastening device of the present invention, in the preferred embodiment thereof.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to FIG. **1**, there is shown the preferred embodiment of the fastening device **10** of the present invention. A pair of spaced legs are provided such as first and second spaced legs **12** and **14** interconnected at adjacent ends as at **16** so as to define a generally U-shaped section **18.** This arrangement then provides a resilient clip. A third leg **20** is interconnected with first spaced leg **12** as at **22** so as to form substantially a right angle at their juncture. A reversely bent, inwardly-extending section **24** is interconnected with third leg **20**

so as to form an acute angle therebetween as at **26.** A resilient tongue **28** is provided associated with the first spaced leg **12** and projects outwardly in a direction away from the point of intersection **22** to extend past the point of intersection **16.** Securing means are provided such as tab **30** formed from second spaced leg **14** projecting inwardly toward the U-shaped section **18.**

First and second spaced legs **12** and **14** may be arranged to converge toward each other at the opening **32** of the generally U-shaped section **18** to allow for reception and tight retention of members of varied thicknesses.

Referring now to FIG. **2,** there is shown a portion of a cabinet **40** of a domestic clothes dryer wherein the fastening device of the present invention may be useful. Cabinet **40** is provided with a base portion **42** wherein are positioned the operational components (not shown) of such a clothes dryer and a top portion **44** serving as a cover member for the cabinet **40** and for gaining access to the operational components. It should be here mentioned that normally a control panel is provided secured to the top portion of cabinet **40** and which normally would include a sequence control timer, switch means and wiring for interconnection with the operational components; these are omitted since they have no bearing upon the present invention. Base portion **42** includes a flange **46** which together with top portion **44** of the clothes dryer cabinet serve as a pair of members to be connected in hingedly assembled relationship. The U-shaped section **18** of fastening device **10** is arranged to receive a portion of a first of the members such as flange **46** and an aperture **48** is provided in flange **46** for receiving tab **30** for securing fastening device **10** thereto. Of course, tab **30** may be provided with teeth to bite into flange **46,** and in such an arrangement there may be no need for aperture **48.**

Top portion **44** of cabinet **40** has been provided with an aperture **50,** elongated in shape, for receiving inwardly-extending section **24** of third leg **20.** Resilient tongue **28** engages a flange **52** formed as a portion of top portion **44** for providing spring-loading to effect tight connection between fastening device **10** and the top portion **44.** In other words, resilient tongue **28** exerts pressure against flange **52** such that inwardly-extending section **24** is forced into tight engagement with the lower portions of the edges of aperture **50.** Resilient tongue **28** then has been designed such that the included angle formed between it and the first spaced leg **12** may range between **2** and **20** degrees. This allows for adequate spacing between base portion **42** and top portion **44** of clothes dryer cabinet **40,** while at the same time maintaining the assembly rattle-free.

It is anticipated that a pair of fastening devices **10** would be necessary for application in such a domestic clothes dryer. They would normally be spaced at opposite ends along the back juncture of the base portion **42** with top portion **44** and at such a distance that there would be provided stability when it would be desired that top portion **44** should be rotated upwardly about fastening device **10** so as to gain access to the operational components located within the base portion **42.** It is expected that the top portion **44** must be raised approximately 30° before it could be disengaged from fastening device **10** and thereby be removed from (or placed in) assembled relationship with base portion **42.** It can be readily seen that, as the top portion **44** is rotated about fastening device **10,** the fastening device, securely fastened to base **42,** would serve as a hinge means, the third leg **20** then projecting into aperture **50** thereby preventing top portion **44** from separating from and falling off the base portion **42** of the clothes dryer cabinet. Fastening device **10** then provides structural support without the need for screws or separate fasteners to hold the device **10** onto the base portion **42** of the clothes dryer.

As the top portion **44** is rotated downwardly toward its normal assembled position, it can be seen then that resilient tongue **28** comes into action again to provide for tight, rattle-free assembly of the cabinet **40.**

Fastening device **10** may be formed of a single piece of sheet metal provided that the metal chosen has adequate resiliency and strength. One material found satisfactory is S.A.E. 1064 Steel, .022 thick.

From the foregoing description and accompanying drawings of the preferred embodiment of the fastening device of the present invention, it can be seen that a pair of members such as the top and base portions of a cabinet of a domestic clothes dryer can readily and easily be secured in a hingedly assembled relationship and without the use of auxiliary fastening means. It can be seen further that such assembly can be accomplished across a wide range of tolerance variations between the members to be hingedly assembled and regardless of thickness variations of the members being hingedly assembled. Although the fastening device and assembly illustrated herein have been in connection with hingedly assembling the top and base portions of a domestic clothes dryer cabinet, it is to be understood that the fastener device and the manner in which it is to be used can also be satisfactorily utilized for mounting other articles or objects in a like fashion such as for example securing the top portion and the base portion of a domestic washing machine in hingedly assembled relationship.

It should be apparent to those skilled in the art that the embodiment described heretofore is considered to be the presently preferred form of this invention. In accordance with the Patent Statutes, changes may be made in the disclosed apparatus and the manner in which it is used without actually departing from the true spirit and scope of this invention.

What is claimed is:

1. In a cabinet having a base member and a top member, a fastening device for hingedly connecting said members to each other, the fastening device comprising:

a pair of spaced legs interconnected at adjacent ends to define a generally U-shaped section for receiving a portion of said base member;

a third leg interconnected with a first of the spaced legs at a free end thereof to form substantially a right angle therebetween, the third leg including an inwardly-extending hinge section formed on a free end thereof engaged in an aperture in said top member for allowing hinged movement of the top member with respect to the base member;

a resilient tongue associated with one of the spaced legs in engagement with the top member to provide a tight connection between the fastening device and the top member; and

means associated with one of the spaced legs in engagement with the base member securing the fastening device to the base member.

2. The fastening device of claim **1** wherein the spaced legs converge toward each other at the opening of the generally U-shaped section.

3. The fastening device of claim 1 wherein the device is formed of a single piece of sheet metal.

4. The fastening device of claim 1 wherein the securing means is a tab projecting from a second of the spaced legs and in engagement with an aperture in the base member.

5. The fastening device of claim 1 wherein the resilient tongue projects outwardly from the point of interconnection of the first spaced leg and the third leg to

extend past the point of interconnection of the first and second legs, there being an included angle formed between the tongue and the first resilient leg of between 2° and 20°.

6. The fastening device of claim 1 wherein the inwardly-extending section of the third leg is reversely bent to form an acute angle with the third leg.

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