

[54] **WEBB FASTENERS**  
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 [73] Assignee: **Lindsay Specialty Products Ltd.**, Lindsay, Ontario, Canada  
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 [51] Int. Cl. .... **A47c 31/00**  
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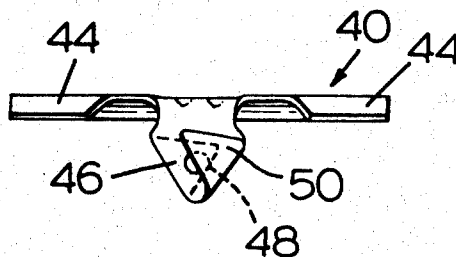
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[57] **ABSTRACT**

An improved web fastener for use in securing webs to tubular chair frames and the like. The improved fastener includes a tongue which is struck from the fastener and which has the first portion projecting outwardly from the body of the fastener. The outer end of the tongue is generally V-shaped when viewed from above and at least one additional portion is integrally connected to the first portion along one of the inclined leading edges and projects rearwardly therefrom. The tongue may also include a second portion connected to the other leading edge and projecting rearwardly therefrom. Each of the portions which project rearwardly from the first portion is outwardly inclined relative to the first portion so as to form a leaf-type spring which is compressible towards the first portion so as to be easily mounted in an opening in use.

**10 Claims, 7 Drawing Figures**



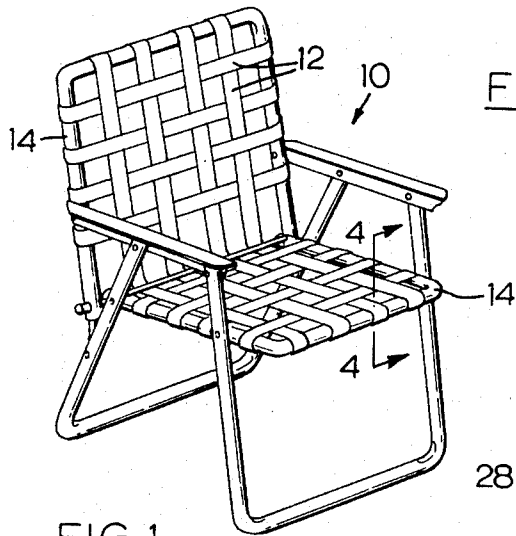


FIG. 1

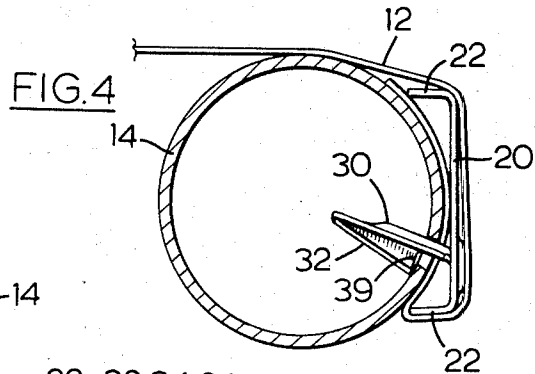


FIG. 4

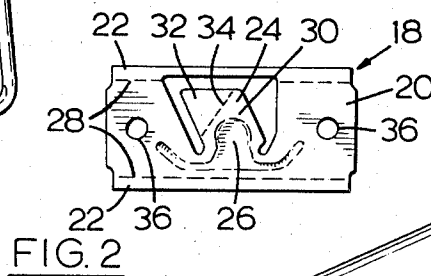


FIG. 2

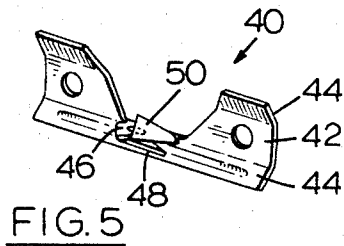


FIG. 5

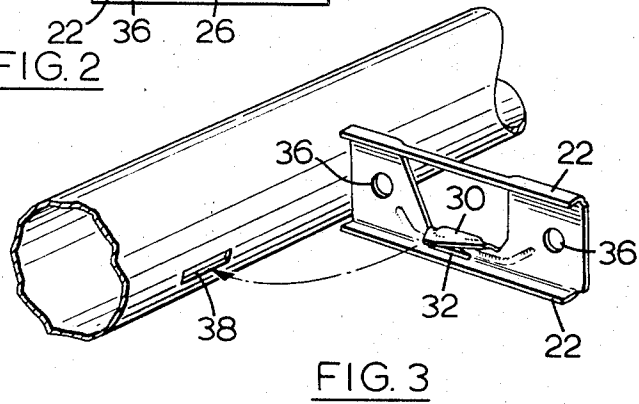


FIG. 3

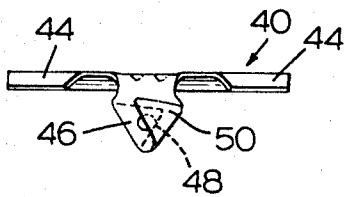


FIG. 6

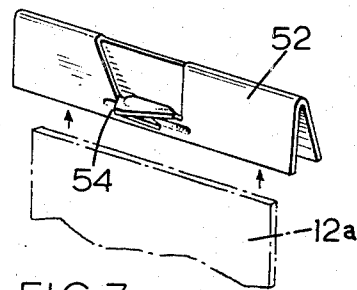


FIG. 7

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## WEBB FASTENERS

## FIELD OF INVENTION

This invention relates to improvements in web fasteners. In particular, this invention relates to improvements in the structure of the locking tongue of a web fastener of the type commonly used in the upholstery industry.

## PRIOR ART

Difficulty has been experienced in providing a locking tongue for a web fastener which is capable of being easily located within a slot formed in a tubular frame member while also serving to provide a rigid anchor for the fastener. Generally the locking tongue has leading edges arranged in a V-shaped configuration and at least one small barb is formed with a trailing edge directed towards the body of the fastener. In order to form a satisfactory fastener, it has been necessary to make the fastener from spring steel stock so as to ensure that the small barb will not be flattened out during the mounting operation. When the fastener is made from spring steel, it has been found that the barbs tend to deform the slot openings formed in aluminum tubular frame members. When the frame members are deformed by the barbs which are carried by the tongue, the fasteners are not firmly secured relative to the tubular frame and can very often be withdrawn through the deformed slot. It has not been possible to increase the length of these short barbs by extending the cuts which are made in the tongue to form the barbs due to the fact that the length of the tongue itself is limited by the length of the blank from which it is formed. The length of the tongue may also be limited in many cases by the diameter of the interior of the tube into which the tongue is to be fitted.

When the known fasteners are made from spring steel a considerable force is required in order to operably locate the locking tongues in the mounting. As the majority of the fastening devices which are used in the upholstery industry are manually secured, the force required to locate the fastening device can lead to considerable worker fatigue with a resulting slow-down in production.

## SUMMARY

The present invention overcomes the difficulties of the prior art described above by providing a web fastener which is inexpensive to manufacture and simple to install. The fastener employs a locking tongue which is formed to provide a leaf type spring portion which is readily deformable such that the fastener is easily located in an operable position. The structure of the web fastener of the present invention is such that it may be manufactured from inexpensive mild steel.

According to an embodiment of the present invention, the present invention provides an improvement in a web fastener of the type used for securing a web to a frame and consisting of a body and a locking tongue, the improvement of the present invention being in the provision of a tongue which comprises a first portion connected to the body of said fastener and projecting outwardly therefrom and a second portion integrally connected to the first portion and overlying a substantial portion of the first portion, the second portion

being obliquely inclined relative to the first portion so as to be resiliently deformable in use to a thickness substantially less than the relaxed thickness of said tongue.

According to a further embodiment of this invention, the improved tongue structure includes a third portion integrally connected to said first portion and overlying a substantial portion of said first portion, the third portion being obliquely inclined relative to the first portion so as to be resiliently deformable in use in a direction towards said first portion so as to facilitate mounting of said tongue in use.

## PREFERRED EMBODIMENT

The invention will be more clearly understood after reference to the following detailed specification read in conjunction with the drawings, wherein

FIG. 1 is a pictorial view of a chair formed from a plurality of webs secured by web fasteners to a tubular frame;

FIG. 2 is a plan view of a blank used in the formation of a fastener according to an embodiment of the present invention;

FIG. 3 is a pictorial view of a web fastener according to an embodiment of the present invention illustrating the manner in which it is secured relative to a tubular frame member;

FIG. 4 is a cross-sectional view taken on the line 4—4 of FIG. 1 showing the manner in which a web fastener of the type illustrated in FIG. 3 is mounted;

FIG. 5 is a pictorial view of an alternative form of fastener construction;

FIG. 6 is a plan view of the fastener of FIG. 5; and

FIG. 7 is a pictorial view of an alternative type of web fastener.

FIG. 1 of the drawings illustrates a chair generally identified with the reference numeral 10 having a plurality of webs 12 secured to the tubular members 14 by means of web fasteners of the type of the present invention.

FIG. 2 of the drawings illustrates a blank generally identified by the reference numeral 18 from which a fastener according to the present invention may be formed. One of the important features of the present invention is that the structure of the locking tongue is such that an effective lock can be achieved when the fastener is made from relatively thin mild steel. The fasteners of the prior art have generally been made from spring steel material measuring from about 0.045 to 0.050 inches in thickness while the fastener of the present invention may be made from a thin sheet of mild steel measuring about 0.024 inches. The use of a mild steel as opposed to spring steel considerably reduces the material costs and has other advantages in that it yields more readily and it is not so inclined to damage the frame members into which the fastener is secured.

As shown in FIG. 2 of the drawings, the blank has a central body portion 20 and a pair of marginal edge portions 22. A locking tongue 24 is formed centrally of the blank and an embossed pattern illustrated at 26 is formed in the blank to provide reinforcement for the tongue as will be described hereinafter. The blank is shaped to its required operative form as illustrated in FIG. 3 of the drawings by folding the marginal edge portions inwardly along the fold lines shown in broken

lines at 28 in FIG. 2. The tongue 24 consists of a first portion 30 and a second portion 32 and the tongue is formed to its operative configuration by folding the second portion 32 along the fold line 34 so that the second portion 32 is located in the position underlying and obliquely inclined relative to the first portion 30 as shown in FIG. 3. A pair of openings 36 may be formed in the central body portion of the blank so as to provide additional means for securing the web to the fastener if required.

It will be noted that the locking tongue illustrated in FIGS. 2 and 3 of the drawings projects outwardly from the central body portion and has a pair of leading edges which are inclined relative to one another and V-shaped when viewed from above. One of the leading edges is formed along the fold line 34 which connects the second portion 32 to the first portion 30. As shown in FIGS. 3 and 4 of the drawings, the frame member 14 is formed with a slot 38 which is adapted to receive the locking tongue of the fastener. The total thickness of the tongue when in its relaxed configuration is considerably greater than the total height of the slot 38. It has been found that by securing the spring-like second portions along the inclined leading edges of the tongue, it is possible to manually locate the tongue in the slot with substantially less force than was previously required with structures employing spring steel barb locking devices. It will be seen that as the narrow leading edge of the tongue enters the slot 38, the relatively thin mild steel second portion 32 will be deflected towards the first portion 30 without requiring any great amount of force to be applied. Once the tongue is located in the operative position shown in FIG. 2, the second portion 32 will recover very readily to about its original inclined position relative to the first portion 30. When in the expanded position within the frame member 14, the trailing edge 39 of the second portion will bear against the inner surface of the tube 14 so as to lock the fastener in a fixed position relative to the frame 14.

An alternative construction for the fastener is illustrated in FIGS. 5 and 6 of the drawings wherein the reference numeral 40 identifies the fastener as a whole. The fastener consists of a central body portion 42 and a pair of inwardly directed edge portions 44. In this construction, the locking lug is again struck from the body of the fastener and consists of a first portion 46, a second portion 48 and a third portion 50. The construction of the tongue is substantially the same as that illustrated in FIGS. 2 and 3 of the drawings with the exception that a third portion is provided. The third portion is connected along the other of the inclined leading edges of the first portion and again it is folded to assume a position overlying the first body portion and inclined relative to the first body portion. This construction provides a pair of trailing edges which engage the inner surface of the tubular member when operably located within a slot 38.

A still further embodiment of the invention is illustrated in FIG. 7 of the drawings wherein the body 52 of the fastener is in the form of a V-shaped clamp adapted to be secured by rivets or by swaging to the end 12a of a web. The tongue 54 illustrated in this embodiment is the same as the locking tongue illustrated in FIGS. 2 and 3 of the drawings and again it is struck from the blank which forms the body of the fastener.

As previously indicated, the blanks are preferably embossed in the area of the tongue as shown at 26 in FIG. 2 so as to add to the rigidity of the tongue. This is particularly desirable in the mild steel construction of the present invention and preferably the embossed portion extends not only through the tongue but also into the adjacent areas of the blank.

From the foregoing, it will be apparent that the fastener of the present invention is simple to manufacture and easy to use.

The clips which have previously been used were manufactured from a spring steel and employed short anchoring barbs. These short barbs damaged the slots formed in the tubular frames which are generally made from aluminum. One of the important problems which the device of the present application has overcome is that by providing a fastener made from relatively thin mild steel, the amount of force required to operably locate the fasteners within the slot has been considerably reduced from that required in mounting the spring steel fasteners. The fastener of the present invention considerably reduces the work fatigue experienced by assemblers. The long leaf spring structure of the tongue of the present invention yields much more readily than the short barbs of the known devices.

It will be understood that the proportions and dimensions of the web fastener of the present invention may be adapted to suit the proportions of the tubing and the slot formed in the tubing with which the fastener is to be used. The fastener will also have dimensions suitable for use with the web which it is to secure.

By way of example and without restricting the scope of the present invention, there follows particulars of the dimensions of the fastener of a type suitable for use with an aluminum tubing measuring 1 inch in diameter and having a slot formed therein measuring  $0.1 \times 0.5$  inches. It has been found that a suitable fastener for this type of tubing may measure three-quarters of an inch in height and the inwardly turned ends may measure one-eighth of an inch. The relaxed thickness of the locking tongue may be in the range of 0.25 to 0.150 and the tongue is inclined at an angle of about  $70^\circ$  to the plane of the central portion of the body of the blank. The fastener is 2 inches in length so as to be suitable for use with the web which is 2 inches wide. The fastener is made from cold rolled steel of commercial quality measuring 24 gauge (0.0239 inches) thickness.

Various modifications of the present invention will be apparent to those skilled in the art without departing from the scope of this invention.

What I claim as my invention is:

1. A web fastener of the type used for securing a web to a frame and consisting of a body having a locking tongue struck from said body and projecting outwardly therefrom, the improvement wherein said tongue comprises a first portion connected to said body, said first portion having a leading edge which is angularly inclined relative to the direction in which said tongue projects, and a second portion integrally connected to said first portion at said leading edge and projecting rearwardly therefrom to overlie said first portion, the plane of said second portion being obliquely inclined relative to the plane of said first portion in a direction away from said leading edge so as to be resiliently deformable in use to a thickness substantially less than the relaxed thickness of said tongue.

2. In a web fastener of the type used for securing a web to a frame and consisting of a body and a locking tongue struck from said body and projecting outwardly therefrom, the improvement wherein said tongue comprises,

- a. a first portion having a pair of leading edges which are obliquely inclined relative to one another so as to form a generally V-shaped forward end projecting outwardly from said body,
- b. a second portion hingedly connected to said first portion along one of said leading edges and extending inwardly therefrom to be arranged in a face-to-face relationship with respect to said first portion,
- c. said second portion being inclined relative to said first portion when in a relaxed configuration so that the first and second portion diverge in a direction away from a leading edge,
- d. said tongue being resiliently deformable to move said second portion towards said first portion to permit said tongue to enter an aperture of a width substantially less than the relaxed height of said overlying first and second portions.

3. An improved web fastener as claimed in claim 2 further including a third portion hingedly connected to the other of said leading edges and extending inwardly therefrom to be disposed in a face-to-face relationship with respect to the other face of said first portion, said third portion being inclined relative to said first portion when in a relaxed configuration so that the first and third portions diverge in a direction away from the leading edge at which they are connected, said tongue being resiliently deformable to permit said third portion to be moved in a direction towards said first portion to permit said tongue to pass through a restricted opening in use.

4. An improved fastener as claimed in claim 3 wherein said first and third portions of said tongue are formed from a unitary portion of said body and said third portion is folded upon said second portion to form said other leading edge at said fold line.

5. A web fastener as claimed in claim 3 wherein said second and third portions extend inwardly from said one leading edge and said other leading edge respectively a distance at least equal to half the width of said

first portion.

6. An improved web fastener as claimed in claim 2 wherein said first and second portions of said tongue are formed from a unitary portion of said body and said second portion is folded upon said first portion to form said one leading edge.

7. A web fastener as claimed in claim 2 wherein said second portion projects inwardly from said one leading edge a distance at least equal to half the width of said first portion.

8. A web fastener as claimed in claim 2, wherein at least said locking tongue is formed from mild steel.

9. A web fastener for securing a web to a frame comprising a body formed from a unitary mild steel blank and consisting of a central panel having a pair of side edge portions projecting outwardly from one side thereof, a portion of said central panel being cut and formed to provide a locking tongue projecting outwardly from said central panel on the same side of said central panel as said outwardly directed side edges, said locking tongue consisting of a first portion having a pair of leading edges which are obliquely inclined relative to one another so as to provide a generally V-shaped projection extending from said central body portion, a second portion of said tongue being hingedly connected to said first portion along one of said leading edges and extending inwardly therefrom and overlying a substantial portion of one face of said first portion, said second portion being upwardly inclined relative to said first portion in a direction away from the leading edge at which it is connected when in a relaxed configuration and resiliently deformable in a direction towards said first portion so as to facilitate the passage of said tongue from a narrow slot in a frame in use.

10. A web fastener as claimed in claim 9 wherein said tongue has a third portion hingedly connected to the other of said leading edges and extends inwardly therefrom to overlie a substantial portion of the other face of said first portion, said third portion being upwardly inclined relative to said first portion, in a direction away from the leading edge at which it is connected, when in a relaxed configuration and resiliently deformable in a direction towards said first portion so as to facilitate the passage of said tongue through a narrow slot in a frame in use.

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