

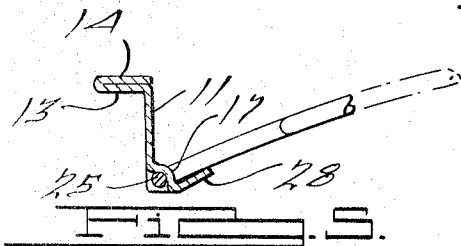
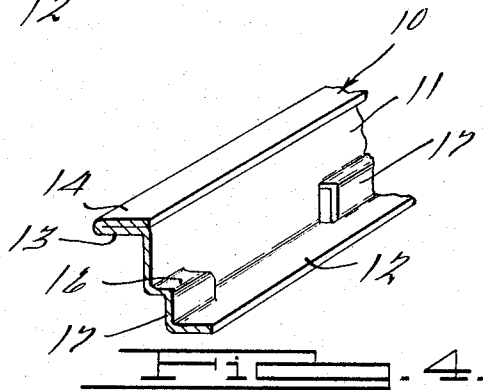
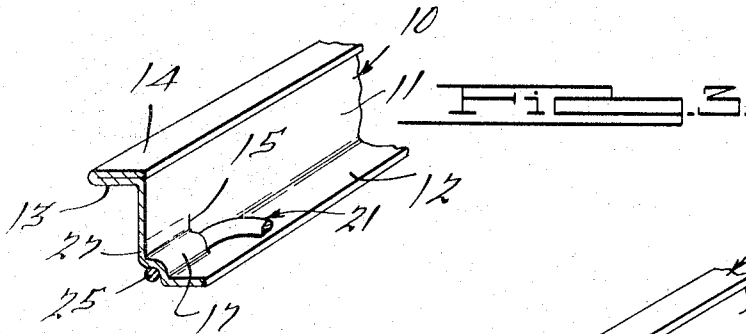
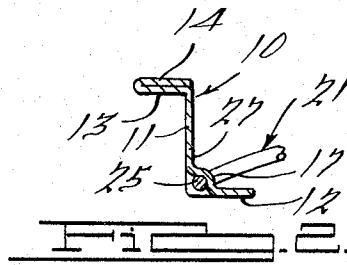
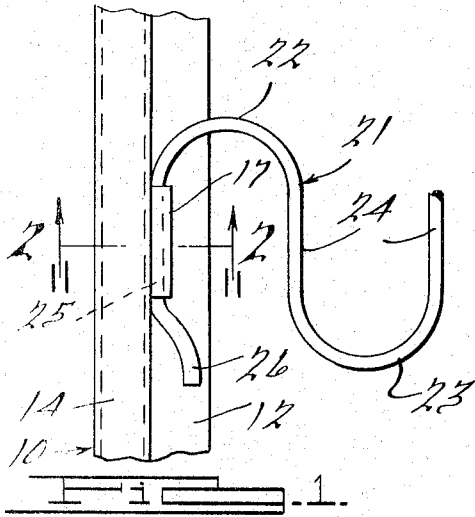
March 14, 1967

G. J. BIRGBAUER, JR

3,308,487

FRAME ELEMENT FOR SUPPORTING SINUOUS SPRING STRIPS

Filed May 18, 1964



INVENTOR  
Gordon J. Birgbauer, Jr.  
BY  
Barnard, McAlpin & Leising  
ATTORNEYS.

1

2

3,308,487

**FRAME ELEMENT FOR SUPPORTING SINUOUS SPRING STRIPS**

Gordon J. Birgbauer, Jr., Grosse Pointe Park, Mich., assignor, by mesne assignments, to Lear Siegler, Inc., Santa Monica, Calif., a corporation of Delaware  
 Filed May 18, 1964, Ser. No. 368,148  
 5 Claims. (Cl. 5—260)

This invention relates to frame elements for supporting spring strips, particularly to a frame element of Z-section having the web and flange lanced to provide collapsible tunnel for receiving the end of the spring strip.

Difficulties have been experienced heretofore in providing securing means for the end of spring strips to elements of a frame of chairs, davenports, beds and the like. Separate clips have been used which are nailed or otherwise secured to the wood members of a frame or lanced fingers were provided in the metal frames over which the ends of the spring strips were secured.

The present invention pertains to the formation of a Z-shaped metal element for the frame made from light sheet material with the metal along one edge reversely bent upon itself to provide additional strength thereto. The web and the other arm of the element are lanced at spaced apart points therebetween with the material formed outwardly in the angle area between the web and arm to provide an elongated tunnel which will receive the supporting end of the sinuous spring strip.

The end is locked in position when the material forming the tunnel has the upper portion forced back into the plane of the web and with the lower portion encompassing the spring strip end. The arc inherent in certain types of spring strips causes a crown to occur to the spring strips which form the seating area. The flange portion of the frame element adjacent to the tunnels may be bent at an angle to force a crown in the spring strips when flat strips are employed.

The frame element provides an exceedingly light frame which has sufficient rigidity and ruggedness to support the ends of the sinuous spring strips which are securely locked thereon after the upper portion of the lanced metal is forced back into alignment with the web of the element.

Accordingly, the main objects of the invention are: to provide a frame element of angle section with lanced areas formed outwardly to provide tunnels for the reception of the end of the sinuous spring strip which is locked to the element when the tunnel portion has a section bent back into the plane of the web of the element; to provide a frame element for securing the ends of the sinuous spring strips with a web and two oppositely extending flanges with the web and one flange lanced at spaced points with the metal therebetween forced outwardly to form an elongated tunnel which, for the end of the spring strip which is secured therein, when a portion of the lanced metal is moved into the plane of the element; to provide a frame element of thin material having a central web and two oppositely extending flanges with elongated tunnel sections cut from the web and one flange with the outer portion of the other flange reversely bent thereupon to add strength to the element, and in general, to provide frame element for supporting the ends of spring strips which is simple in construction, and which securely locks the end of the spring strip thereto in the area between a flange and the web portion of the element.

Other objects and features of novelty of the invention will be specifically pointed out or will become apparent when referring, for a better understanding of the invention, to the following description taken in conjunction with the accompanying drawings, wherein:

FIGURE 1 is a plan view of a frame element having a

spring secured thereto in a manner embodying features of the present invention;

FIG. 2 is a sectional view of the structure illustrated in FIGURE 1, taken on the line 2—2 thereof;

FIG. 3 is a perspective view of the structure illustrated in FIG. 2;

FIG. 4 is a view of the structure illustrated in FIG. 3 before the sinuous spring strip is secured thereto; and

FIG. 5 is a view of structure, similar to that illustrated in FIG. 2, showing another form of the invention.

The frame element 10 of the present invention, employed in chairs, davenports, beds and the like, is made from a thin sheet of material having a web 11, an inwardly extending flange 12 and an outwardly extending flange 13 forming a substantial Z-section. The flange 13 has an extending portion which is bent back on itself to form an overlapping flange 14 for adding strength to the element. The adjacent portion of the web 11 and the flange 12 are lanced at 15 with the section 16 therebetween forced inwardly into the area between the flange 12 and web to form an elongated tunnel 17. As illustrated in FIGURE 1, the sinuous spring strip 21 has oppositely disposed loops 22 and 23 joined by straight portions 24. The endmost straight portion 25 has a reversely bent end section 26 which prevents the portion 25 from moving outwardly of a securing tunnel or clip. Because of the large end portion 26, the tunnels 17 are elongated so that the end 26 can be moved therethrough when the end of the spring 25 is to be secured thereby.

As illustrated in FIGURES 1 and 2, after the end 25 is within the tunnel 17, the upper portion 27 of the sections 16 is bent back into the plane of the web 11. This clamps the lower portion of the section 16 about the end section 25 of the spring strip to securely lock it in position.

The spring strip 21 illustrated in FIG. 2 is formed on an arc of small radius which is extended into an enlarged radius when both ends of the spring strip is secured to oppositely disposed frame elements. This leaves the crown in the assembled spring strips and in the cushion formed thereby.

In FIG. 5 a flange 28, which is similar to the flange 12 is sloped upwardly at an angle to force a crown in the spring strips when flat or substantially flat spring strips are employed across the oppositely disposed frame element.

The frame element 10 can be secured to wood rails at opposite sides of a chair and can be employed on all four sides thereof. The frame element can be of continuous length or separate lengths when welded or otherwise secured together to form the front, rear and side rail elements of the seat frame. A similar construction can be employed for the frame of a davenport or bed in which case thicker sheet material will be used for the frame elements to withstand the greater load.

What is claimed is:

1. In combination, a plurality of sinuous spring strips, a frame element for supporting the ends of said sinuous spring strips, said element having a web and a flange portion extending therefrom, and sections lanced in an adjacent web and flange portion which are pushed outwardly to form elongated tunnels between the web and flange portion, the ends of said sinuous spring strips being disposed in said tunnels.

2. A frame element for supporting the end of a sinuous spring strip, said element having a web from which flange portions extend in opposite directions to provide a substantially Z-shaped cross section, the inwardly extending flange portion and the adjacent portion of the web having sections severed therefrom by pairs of lanced cuts extending therethrough, the severed sections being bent into the angle between the web and flange portion to form elongated tunnels for receiving the ends of the spring

3

strip, the ends being locked in position when a portion of the severed section is bent back substantially into the plane of the web.

3. A frame element for supporting the end of a sinuous spring strip, said element having a web from which flange portions extend in opposite directions to provide a substantially Z-shaped cross section, the inwardly extending flange portion and the adjacent portion of the web having sections severed therefrom by pairs of lanced cuts extending therethrough, the severed sections being bent into the angle between the web and flange portion to form elongated tunnels for receiving the ends of the spring strip, the ends being locked in position when a portion of the severed section is bent back substantially into the plane of the web, said inwardly extending flange sloping upwardly to form an angle less than 90 degrees with said web.

4. A frame element for supporting the end of a sinuous spring strip, said element having a web from which flange portions extend in opposite directions to provide a substantially Z-shaped cross section, the inwardly extending flange portion and the adjacent portion of the web having sections severed therefrom by pairs of lanced cuts extending therethrough, the severed sections being bent into the angle between the web and flange portion to form elongated tunnels for receiving the ends of the spring strip, the ends being locked in position when a portion of the severed section is bent back substantially into the plane of the web, the outwardly extending flange portion being bent back upon itself to add strength to the element.

4

5. In combination, at least one sinuous spring strip, a frame element for supporting the end of said sinuous spring strip, said element including a web and a flange extending angularly away therefrom, a section lanced in adjacent web and flange portions and pushed outwardly without stretching thereof to form an elongated tunnel between said web and said flange, an end straight portion of said sinuous spring strip being disposed in said tunnel.

## References Cited by the Examiner

## UNITED STATES PATENTS

2,427,393	9/1947	Eckel	29—521 X
2,532,875	12/1950	Asaro	267—110
2,657,738	11/1953	Kruszona	5—260 X
2,669,290	2/1954	Neely	5—260 X
2,695,658	11/1954	Flint	5—260 X
2,934,133	4/1960	Pawlikowski	5—260
2,950,486	8/1960	Heyl	5—260
3,217,894	11/1965	Shewell	248—224 X

## FOREIGN PATENTS

248,782	1/1964	Australia.
563,624	1/1958	Belgium.
657,162	2/1938	Germany.
26,479	11/1910	Great Britain.

FRANK L. ABBOTT, *Primary Examiner.*M. O. WARNECKE, *Assistant Examiner.*