

[54] **MODULAR FURNITURE STRUCTURES**
[72] Inventor: **Carlo Haumer**, Via S. Giuseppe,
Mompiano (Brescia), Italy
[22] Filed: **May 27, 1971**
[21] Appl. No.: **147,533**

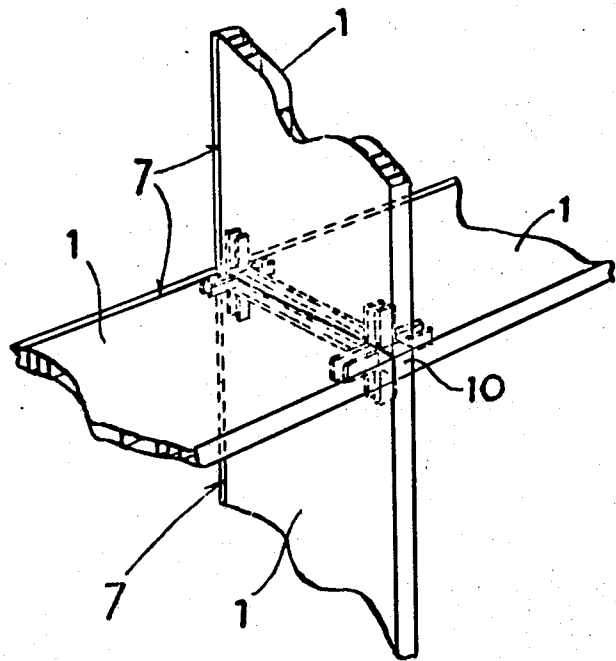
[30] **Foreign Application Priority Data**
May 29, 1970 Italy.....25268 A/70
July 21, 1970 Italy.....27676 A/70
[52] **U.S. Cl.**108/111, 211/148, 312/111,
287/54 C
[51] **Int. Cl.**A47b 47/04
[58] **Field of Search**....108/111, 60, 114, 59, 64, 101;
312/257, 111, 140.3, 263, 108; 287/54 C, 54
A; 211/177, 148

[56] **References Cited**
UNITED STATES PATENTS
1,076,116 10/1913 Hatfield.....312/111
3,181,923 5/1965 Guillon.....312/263 X
3,190,710 6/1965 Freeman.....108/111 X
3,197,822 8/1965 Herrschaft.....287/54 C
3,383,821 5/1968 Gatch.....211/177 X

3,563,626 2/1971 Ferdinand108/152
FOREIGN PATENTS OR APPLICATIONS
801,441 1/1951 Germany287/54 A
Primary Examiner—Francis K. Zugel
Attorney—Ralph M. Watson

[57] **ABSTRACT**
Modular furniture is disclosed which is made up by linking together a series of hollow, internally ribbed panel elements, which are adapted to function as walls and partitions and shelves, through elongated, rectangular joint members which are interposed between the adjacent edges of each pair of panel members; each joint member being provided with a set of fingers and fins projecting from each of its faces that borders on edge of a panel member so that such fingers and fins project, respectively, into sockets and slots formed by the internal ribbing and walls of that panel member and hold it in position. Each finger is preferably formed with two elastic prongs whose facing sides slope toward each other so that they can be spread apart by a wedge member associated with the socket in the panel which that finger enters, to force those prongs against the walls of that socket.

4 Claims, 12 Drawing Figures



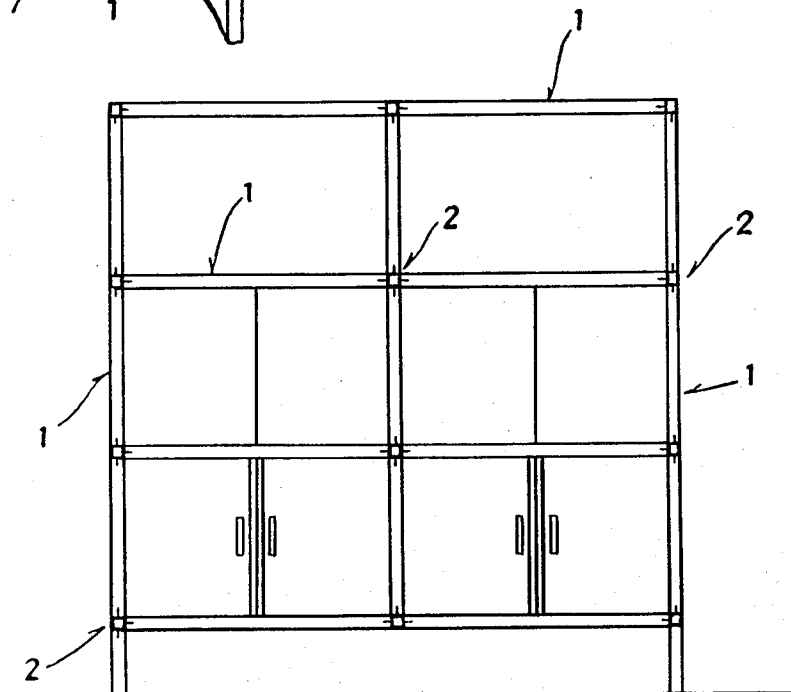
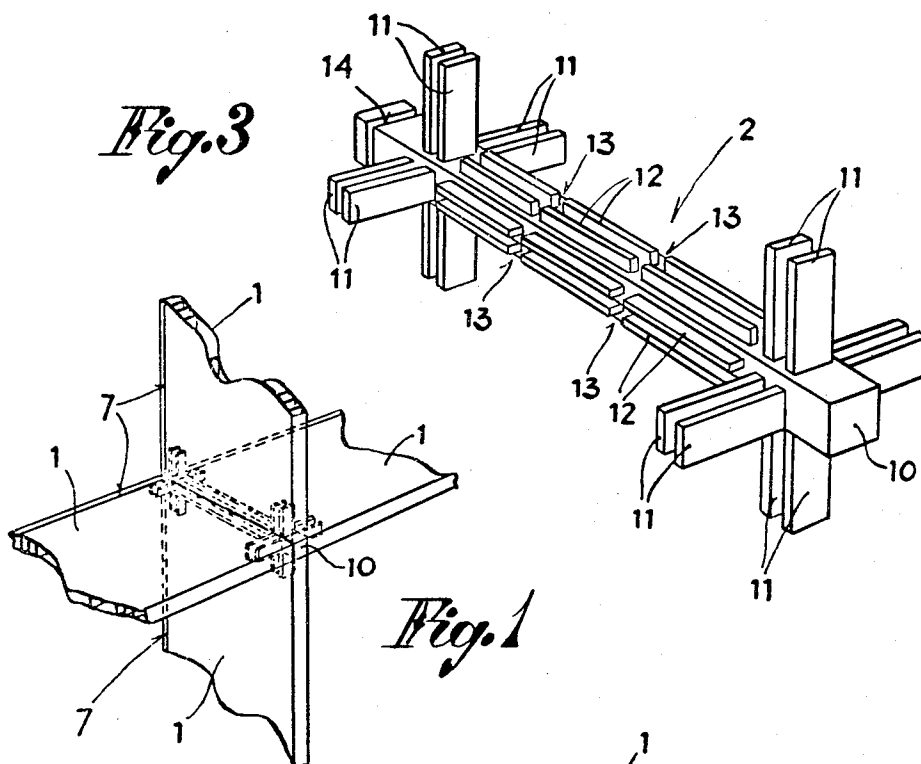
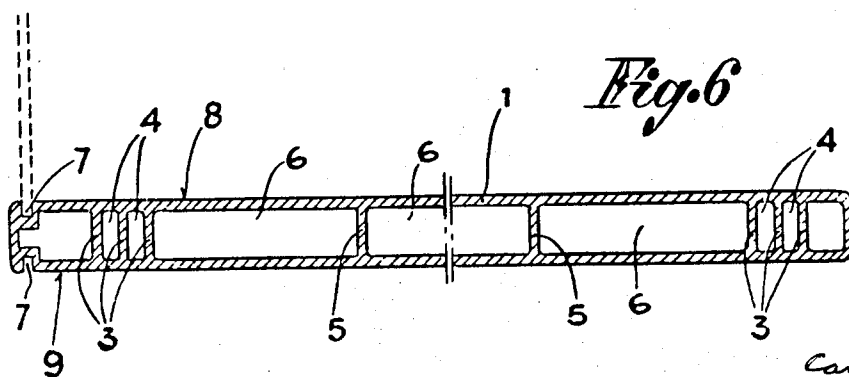
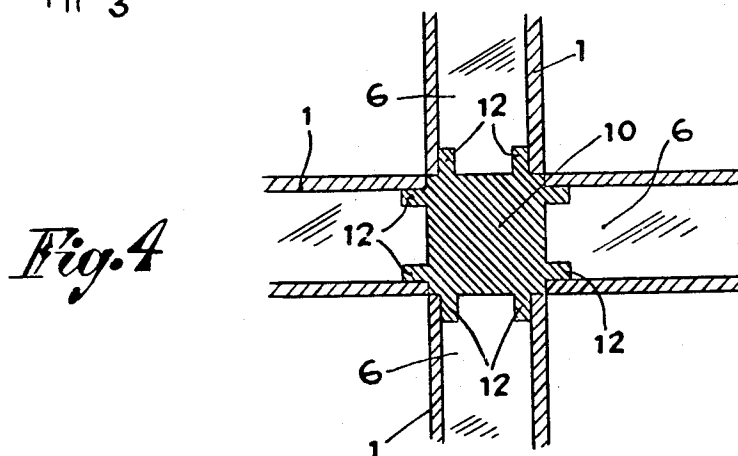
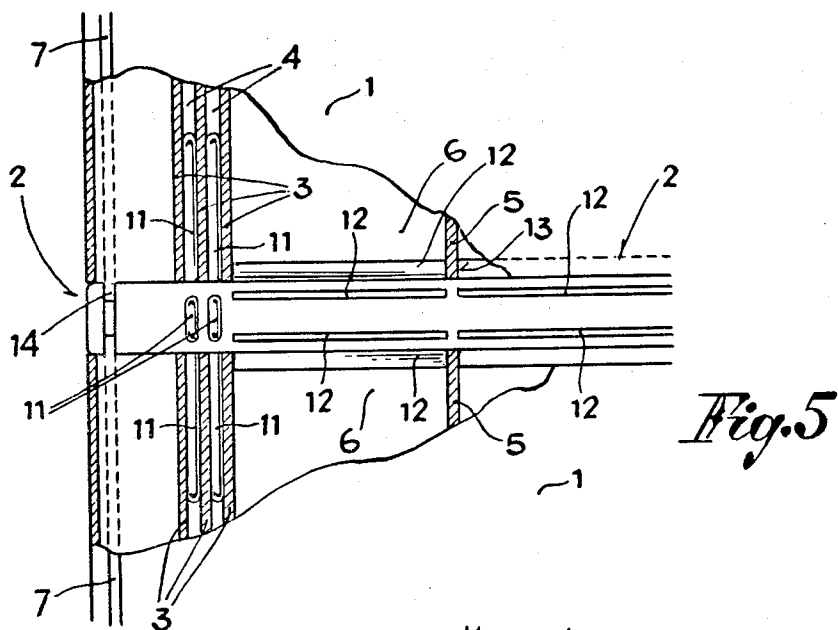
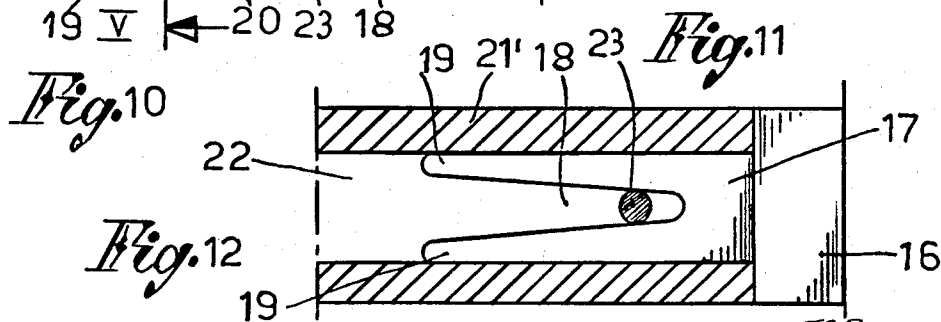
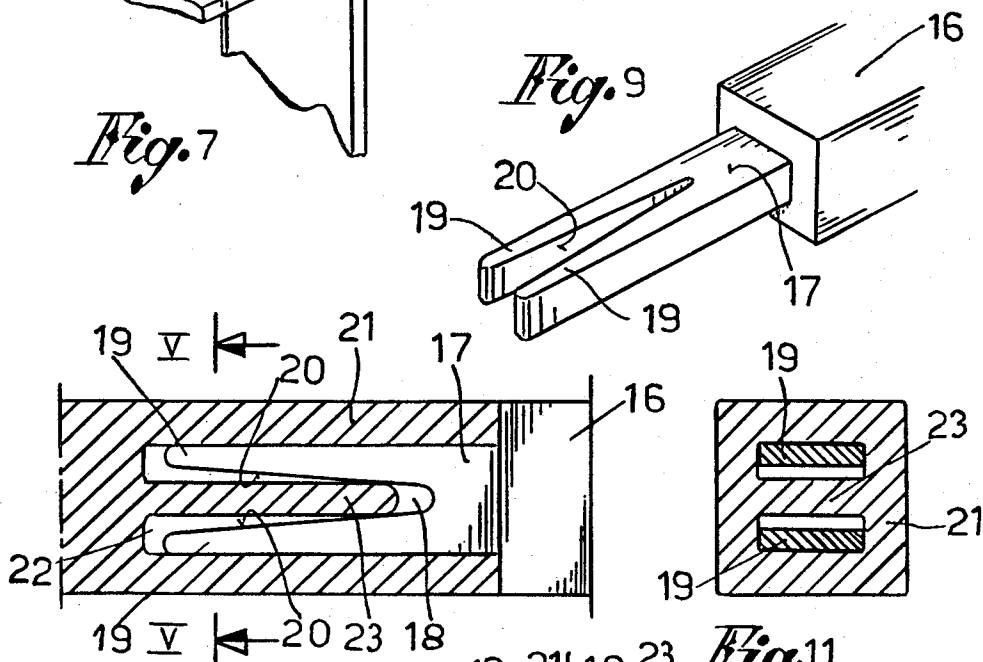
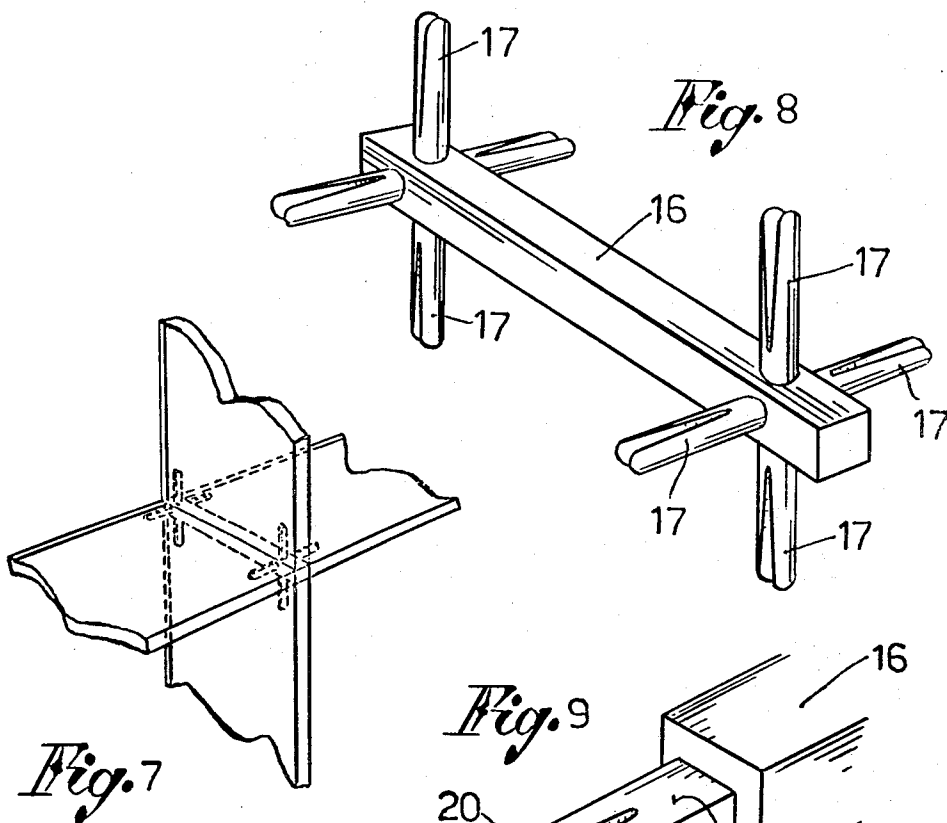


Fig. 2 INVENTOR
 Carlo Haumer
 BY
 Ralph M. Watson
 ATTORNEY



INVENTOR
Carlo Haumer
 BY
Ralph M. Ivation
 ATTORNEY



INVENTOR
 Carlo Clausen
 By Ralph M. Wagon
 ATTORNEY

MODULAR FURNITURE STRUCTURES

The object being examined consists of a piece of furniture such as for example, shelves, a bookcase, a small table, etc., which can be assembled using sections moulded in suitable plastic material, these sections being slotted into each other. There are two main sections, one of which is flat and can be used to form the vertical walls and partitions as well as the horizontal surfaces of the structure. The second element consists of a joint which locks the flat sections together where these meet. One of the main features of the invention in question is that the flat sections have a series of slots or sockets. Into these slots are fitted the pairs of vanes which are to be found on the joint section in line with the axis of the same and extending in the direction of the flat section (walls, partitions, or shelves) in such a way as to link one section to the next.

Another feature of the invention is that the joint element may have pairs of vanes on two, three or all four sides according to whether two, three or four flat sections are to be locked together.

Yet another feature of this invention are the grooves which are to be found on both the flat section and the joint element and which serve to house and fix the panel which is designed to form the rear wall of the resulting piece of furniture. These grooves are coordinated and aligned with each other.

With reference to the drawings enclosed which are merely to give an idea and are not limitative in which:

FIG. 1 shows in perspective an example of the interlocking of several sections;

FIG. 2 shows an example of the piece of furniture obtained;

FIG. 3 shows a joint element in perspective;

FIG. 4 shows a cross-section of FIG. 1 obtained with a normal plane at the intersection of the flat sections;

FIG. 5 shows a joint element and also a detail of the assembling of two shelves in partial section; and

FIG. 6 shows a transverse section of the flat section which is used to form the walls, shelves and partitions of the piece of furniture.

The structure being examined is made up of flat sections 1 which are coordinated with each other to form the vertical walls and partitions as well as the horizontal surfaces of the structure plus a number of joint elements 2 which serve to link together the flat sections at the corners where they meet. Each of these flat sections, which are moulded in plastic so as to be preferably hollow, has the following features: two sets of three internal longitudinal ribs which form two slots or sockets in the headpiece of the flat sections 3 and 4; two intermediate internal ribs also running lengthwise 5 and which in their turn form slots or sockets 6; and two grooves 7 which are to be found on the upper and lower surfaces of the flat sections 8 and 9 located towards the rear part of the section.

Each of the joint elements has the following features: each joint consists of a square-shaped bar 10 also moulded in suitable plastic material; on each side of this bar are located two pairs of elastic vanes which run lengthwise to the body of the bar, perpendicular to its axis; there are also sections of parallel vanes running lengthwise along the body of the bar, projecting sideways in relief 12 and which form 13. At at least one end of the bar there is a notch or groove which runs around the whole perimeter of the bar 14.

When assembling these sections so as to construct a piece of furniture as, for example, shelves, a bookcase, a small table or the like, the flat sections are placed in an ordered manner so as to form the walls, partitions and shelves and, at the corners where these meet, the joint elements are used to link them together 2. They are assembled in such a way that the pairs of vanes are embedded in the slots of the section to be linked 4, these being formed by the series of internal ribs 3, while the sections of the vanes running along the sides of the joint element are fixed into the slots 6 formed by the internal intermediate ribs 5.

The scaling of the various coordinated parts is such that a rigid, stable unit is obtained which is then completed with a panel (not shown) which forms the rear wall of the piece of furniture. This panel is inserted and fixed in the grooves or notch 7, 14 of the flat section 1 and the joint elements 2.

This invention may also be used to construct in another manner which represents an improvement on the one mentioned above. This concerns a modular piece of furniture which can be assembled using sections which can be used to constitute the vertical walls and horizontal surfaces of the structure and joint elements which have pairs of elastic vanes on each side, these being then embedded in suitable sockets or slots located in the headpiece of the flat sections to be linked together.

To go into more detail, a particular type of joint is involved in the construction of this type of modular furniture. The joint conforming to the present invention is also made up of an element, e.g. square-shaped; on each side and/or headpiece of this element is located, or fixed, a pin which is perpendicular to the axis of the element itself and which is split lengthwise so that two elastic vanes are formed. The facing sides of these vanes slope towards each other. The pin itself is coordinated with a core or pin which is fitted in the hole in the headpiece of the section which is to be linked. The core or pin inside this hole engages in the split in the pin of the joint element in such a way as to force apart the elastic vanes of the pin, thus making these vanes adhere forcibly to the internal surfaces of the hole in the flat section to be linked and in this way to other elements of the structure.

The aim of the invention being examined is to achieve an improved joint of the type given above and performing the same functions, also moulded preferably in plastic so as to be hollow, and which can be used easily to link together elements generally to construct modular furniture such as, for example, bookcases, shelves, etc.

With reference to the drawings enclosed in which:

FIG. 7 shows in perspective the linking together of several sections;

FIGS. 8 and 9 show in perspective two types of joint;

FIGS. 10 and 11 show a cross-section of the linking together of joint and section to be linked; and

FIG. 12 shows in cross-section the linking of a joint to a tubular element.

The joint being examined consists of a body 16; on at least one side of this and/or on at least one of its headpieces is located or fixed a pin 17 which is perpendicular to the relative headpiece. The aforementioned pin 17 is split lengthwise 18 of a suitable length and this

split forms two elastic vanes 19 whose internal facing surfaces slope towards each other 20.

As mentioned above, the joint is moulded in plastic material preferably and should be hollow and is used to link together various sections in order to construct modular furniture. With this in mind, each of the joint elements, which may also be moulded in plastic material, has at least one hole or slot 22 which extends lengthwise inside the section and which may be square or round. This hole or slot corresponds to the pins of the joint elements. Inside the hole is located or fixed, depending on the case, a core or pin 23 which is lodged in the split in the pin of the joint element 18, thus engaging the two elastic vanes of the aforesaid pin 19.

In order to assemble the elements in such a way as to construct a piece of furniture, the pins of the joint element are housed in the holes of the sections to be linked so that the relative core or pin 23 (see FIG. 9) engaging the sloping surfaces of the pins of the joint elements forces apart these elastic vanes which thus adhere forcibly to the internal surfaces of the hole so as to ensure a secure linking and perfect interlocking of the joint and the element. In order to increase the adherence of the pins of the joint element to the internal surfaces of the relative hole or slot, the lateral surfaces of the pins may be suitably knurled.

FIG. 9 represents a joint with only one pin, this being particularly suitable for the linking together in line of elements used to construct, for example, coatstands, parts of stairs, stools, etc., forming the uprights or beams of these structures.

FIG. 12 shows the way in which the joint described and a tubular element are linked together, the tubular element 21 being provided with a pin 23 which engages

the elastic vanes of the pin of the joint element 19 and 17 as described above. In this case, the tubular element may also be made of metal.

I claim:

1. Modular furniture structure comprising elements moulded in plastic slotted in to each other, including flat sections 1 linked together by means of joints 2, each of the flat sections being hollow and having two series of three internal ribs 3, each series forming two sockets or slots 4 and two intermediate internal ribs 5 which in their turn form two sockets or slots 6 and two grooves or notches running lengthwise on the upper and lower surfaces of the section itself located towards the rear side.

2. Modular furniture structure conforming with claim 1 in which each of the joints is made up of square-shaped bar 10 on each side of which are located two pairs of elastic vanes 11 extending normally to the axis of the bar and sections of vanes running lengthwise and parallel to each other 12 projecting sideways and forming the relative ends 13 of the slots where the intermediate ribs 5 of the flat section are housed.

3. Modular furniture structure conforming to claim 2 in which the joint element presents a notch or groove 14 running around the entire perimeter of the element, located towards the end of the bar, and which corresponds to the groove which is to be found on the flat section.

4. Modular furniture structure conforming to claim 2 in which the elastic vanes 11 of the joint element 2 are elastically coordinated to the slots 4 of the flat section while the parallel vanes running lengthwise 12 are in their turn matched to the slots or sockets 6 formed by the internal intermediate ribs of the said flat section.

* * * * *

40

45

50

55

60

65

UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,685,465 Dated August 22, 1972

Inventor(s) Carlo Haumer

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

First page of patent after line "[72]" insert the following line:

-- [73] Assignee: ANIC S.p.A., Palermo, Italy --.

Signed and sealed this 5th day of March 1974.'

(SEAL)
Attest:

EDWARD M. FLETCHER, JR.
Attesting Officer

C. MARSHALL DANN
Commissioner of Patents