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(54) **Knock down metal slat for beds**

Zerlegbarer metallener Bettrahmen

Sommier métallique démontable

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Description

1. TECHNICAL FIELD OF THE INVENTION

[0001] The present invention relates generally to knock down metal slat for bedding product which is quick simple and easy to assemble and disassemble besides allowing flexibility, easy storage and transportation.

2. BACKGROUND OF THE INVENTION

[0002] A conventional bedding system comprises a bed frame to which a headboard or footboard may be attached. The frame includes a pair of longitudinal extending side rails and a pair of transversely extending end rails extending between the side rails. Additionally the bed frame includes a series of transverse slats that extend between the longitudinal side rails for supporting either a mattress or a combination of box springs and mattress.

[0003] The conventional bed slats comprises a series of transverse slats which are arranged in parallel arrangement in the form of a massive grid-like structure and one or two of these structures are attached to the longitudinal side rails of the bed frame to provide support for the mattress or the box spring. Due to the bulkiness of the above structures the assembly and disassembly of the bed slats are not simple and would require some skilled expertise to assemble and disassemble the bed. Further more storage space is required to store the massive structures and transportation and freight cost is accordingly high.

[0004] Attempts have been made to overcome the above setbacks by providing a knock down rolling slat. These are slats which are joined by flexible chained rubber to enable the slats to be rolled up the same manner as a mat is rolled up when dismantled from the longitudinal side rails. To a great extent the above invention has made storage and transportation simple and less costly. However being joined by flexible chained rubber, the rolling slat may not provide sufficient rigidity and its durability has to be compromised as the rubber component of the joint may deteriorate in elasticity and harden after years of use which may cause it to snap. Further the length of the rolling slats are dependant on the length of certain bed size meaning that each type of rolling slat will only fit its complementary bed size thereby restricting flexibility.

[0005] It would hence be extremely advantageous and cost saving if a knock down metal slat which is durable, rigid and light besides affording the flexibility of having bed slats which can be fitted to any size of bed (length-wise) is made available. It is therefore an aim of the invention to provide such a bed slat.

3. SUMMARY OF THE INVENTION

[0006] Accordingly, it is the primary aim of the present

invention to provide knock down metal slats for beds which are capable of easy assembly and disassembly;

[0007] It is yet another object of the present invention to provide knock down metal slats for beds which are light but rigid;

[0008] It is yet another object of the present invention to provide knock down metal slats for beds which reduces storage space thereby saving cost;

[0009] It is yet another object of the present invention to provide knock down metal slats for beds which is easy to transport thereby reducing freight cost;

[0010] It is yet another object of the present invention to provide knock down metal slats for beds which can be packaged and shipped as a separate item requiring assembly by the purchaser at desired location;

[0011] It is yet another object of the present invention to provide knock down metal slats for beds which provides flexibility in that the metal slats can be individually attached to the side rails according to the length of the side rails;

[0012] It is yet another object of the present invention to provide knock down metal slats for beds which need no screws, brackets, rivets, fasteners which are commonly lost or misplaced thus requiring replacement and delaying assembly of the frame;

[0013] It is yet another object of the present invention to provide knock down metal slats for beds catering for the cash and carry market;

[0014] It is yet another object of the present invention to provide knock down metal slats for beds which comprises smaller and detachable parts thereby enabling convenient handling when compared with the conventional bed slats which consist of a massive structure;

[0015] It is yet another object of the present invention to provide knock down metal slats for beds which need no welding thereby reducing manufacturing cost and eliminating problems associated with welding which tend to result in imperfections arising at the point of welding thereby providing a standardized product;

[0016] It is yet another object of the present invention to provide knock down metal slats for beds capable of providing a flush finishing;

[0017] It is yet another object of the present invention to provide knock down metal slats for beds where the individual components are replaceable.

[0018] These and other objects of the present invention are achieved by,

[0019] a bed frame according to the appended patent claim.

4. BRIEF DESCRIPTION OF THE DRAWINGS

[0020] Other aspect of the present invention and their advantages will be discerned after studying the Detailed Description in conjunction with the accompanying drawings in which:

FIG.1 is a perspective view of the longitudinal side

rail of the bed frame and some of the metal slats of the present invention;

FIG. 1-A is an enlarged view of the press and release mechanism of the metal slat;

FIG. 1-B is an enlarged view of the metal slat before being fitted with the press and release mechanism showing the first and second openings;

FIG. 1-C is an enlarged view of the longitudinal side rail showing the hollow rectangular section;

FIG. 2 is a longitudinal cross-sectional view of FIG. 1-A at line A-A;

FIG. 3 is an exploded fragmentary perspective view similar to FIG. 2;

FIG. 3-A the enlarged side, top and bottom views of the insert;

FIG. 4 is a fragmentary perspective view of the metal slat after being fitted to the longitudinal side rail.

5. DETAILED DESCRIPTION OF THE DRAWINGS

[0021] The invention will be more clearly understood from the following description of the preferred embodiment thereof, given by way of example only with reference to the accompanying drawings which are not drawn to scale.

[0022] Referring to FIG. 1, 1-A and 1-B are the respective perspective views of the longitudinal side rail of the bed frame and some of the metal slats, an enlarged view of the exterior parts of the press and release mechanism (6) and an enlarged side view of the end portion of the metal slat (4) before the press and release mechanism is being fitted. The side rail (2) of the bed frame is preferably made of metal and preferably has a rectangular section, however it may be of a square, round or elliptical section. The side rail (2) has a hollow interior (8) to accommodate the end portion of the metal slat (4) and is provided with slots (9) complimentary to the configuration of the metal slat (4) on the vertical surface (2A) of the side rail (2) opposing the other pair of side rail (2). The metal slat (4) is preferably a round pipe which has two openings, a first opening (10) and a second opening (12) at the end portion of the metal slat (4). The first opening (10) is located nearer the edge of the metal slat (4) whilst the second opening is provided at a distance further from the edge of the metal slat (4) than the first opening (10). The first opening (10) is preferably smaller than the second opening (12) and is configured for the bent terminal (14A) of the compressed spring wire (14) to be threaded therethrough [See FIG. 2 for a more detailed illustration] whilst the second opening (12) is for the insertion of a short insert (16) to which is attached a stopper (18) for

the placement of the finger. It is to be understood that the invention can function well without the stopper (18) as the stopper (18) is merely a tool used to facilitate the act of depressing the insert (16) onto the compressed spring wire (14) and to provide comfort to the user. In absence of the stopper (18) the finger is placed directly onto the insert when exerting pressure and this may cause some discomfort to the user when the press and release process is repeated.

[0023] FIG. 2 is a vertical cross sectional view of FIG. 1A at line A-A and shows the compressed spring wire (14) being inserted into the hollow interior (8) of the metal slat (4). The compressed spring wire (14) is "U" shaped and is similar to the portion of the safety pin opposing the safety pin head. The compressed spring wire (14) is actually a length of wire which is bent back on itself forming a loop (14B) with two arms extending therefrom, a long and short arm (14C) (14D). The compressed spring wire (14) is configured as such to give it a springing effect. The longer arm (14C) has its terminal (14A) bent so as to form an "L" shaped configuration to enable the bent terminal (14A) to protrude through the first opening (10) of the metal slat (4) when the compressed spring wire (14) is inserted into and positioned in the hollow section (8) of the metal slat (4). The shorter arm (14D) rests on the inner surface (20) of the metal slat (4) opposing the surface provided with openings (10)(12). The "U" shaped configuration of the compressed spring wire (14) which gradually widens away from the loop (14B) enables the compressed wire (14) to be kept securely in position besides giving a springing effect when the pressure of the longer arm (14C) is being released.

[0024] FIG. 3 and 3-A respectively illustrates an exploded fragmentary perspective view similar to FIG. 2 and the enlarged views of the insert (16) from the side, top and bottom. The insert (16) has the exposed end which protrudes out from the second opening (12) provided with a shallow depression (16A) adapted to receive the stem (18A) of the stopper (18) for a snug abutment whilst the inserted end of the insert (16) which lies inside the hollow section (8) of the metal slat (4) is provided with an indentation (22) preferably having the configuration of a "key hole" to accommodate the long arm (14A) of the compressed spring wire (14). The "key hole" configuration consisting of a round head (22A) combined with a constricted neck (22B) is chosen as the round head (22A) can snugly accommodate the circumference of the long arm (14C) of the compressed spring wire (14) whilst the constricted neck (22B) serves as a self locking function captivating the long arm (14C) of the compressed spring wire (14) once lodged into the round head (22A) of the indentation (22). The compressed spring wire (14) is prevented from dislodging unless upon sufficient force being applied to separate the long arm (14C) of the compressed spring wire (14) from the round head (22A). The circumference of the round head (22A) is equivalent to the circumference of the compressed spring wire (14).

[0025] When in operation the stopper (18), acting as

a detachable tool to facilitate use of the press and release mechanism to insert metal slats (4), is abutted to the exposed end of the insert (16) by its stem (18A), and is depressed by applying finger pressure. The act of depressing the stopper (18) causes the insert (16) to accordingly be depressed which in turn presses down onto the longer arm (14C) of the compressed spring wire (14) attached to the inserted end of the short insert (16) thereby lowering it and eventually withdrawing the bent terminal (14A) which protrudes from the first opening (10) of the metal slat (4) into the hollow section (8) of the metal slat (4) thereby enabling the end portion of the metal slat (4) to be inserted into the slot (9) on the side rail (2) with ease and without hinderances from the protruded bent terminal (14A). Once the metal slat (4) is inserted into the slot (9) on the side rail (2), the stopper (18) is detached from the insert (16) and is then abutted to the exposed end of another insert (16) and the process is repeated until the required number of metal slats (4) are inserted into the slots (9) on the side rail (2).

[0026] The portion of the metal slat (4) provided with the first opening (10) may be fitted with a protective annular casing (24) configured to have an opening identical in size to the first opening (10) so that when the annular protective casing (24) is fitted to that portion of the metal slat (4) both the first opening (10) and the opening on the casing (24) would coincide to enable the bent terminal (14A) of the compressed spring wire (14) to be threaded therethrough. The function of the protective annular casing (24) is to provide stability to the metal slat (4) which is inserted into the slots (9) on the side rail (2) and also protects the metal slats (4) from abrasions during assembly and disassembly besides reducing the clanking noise when two metal surfaces comes into contact. When the portion of the metal slat (4) which may be provided with the protective casing (24) is completely inserted into the slot (9) of the side rail (2) the pressure on the stopper (18) is released resulting in the insert (16) and the longer arm (14C) of the compressed spring wire (14) springing back to equilibrium or original position and the bent terminal (14A) protrudes out again from the first opening (10). The protruded bent terminal (14A) now comes into contact with the inner vertical surface (8A) of the hollow side rail (2) to act as a self locking mechanism preventing the metal slat (4) from disengaging itself from the slot (9) of the side rail (2). This provides a secured engagement without the use of any bolts, nuts, screws, rivets or fasteners.

[0027] FIG. 4, a fragmentary view of the preferred embodiment of the metal slat (4) being fitted to the side rail (2). When so fitted only part of the annular protective casing (24) and part of the insert (16) is visible. Although some metal slats (4) are illustrated in the figure, any number of slats (4) may be used accordance with the present invention. What is advantageous in the present invention is that the metal slat (4) can fit any bed size as the number of metal slat (4) is individually fitted unlike conventional models which is not so fitted but as a whole

structure.

[0028] It will be appreciated that whilst the said metal slat and slot of the side rail has been described and illustrated in some detail as comprising a round section the above is not necessarily the only shape, configuration or design that can be utilized. For example other shapes and configuration such as rectangular, triangular, oval or square section can be used, however, what is advantageous in accordance with the present invention is the fact that the invention is capable of providing knock down metal slats which has the flexibility of the metal slats being individually fitted to the slot of the side rail with ease.

[0029] Whilst the said compressed spring wire (14) has been described and illustrated in some detail as being of a round section it will be appreciated that also a square or oval section can be used, however, what is advantageous in accordance with the present invention is the fact that the invention is capable of providing a press and release mechanism.

[0030] While the preferred embodiment of the present invention and their advantages have been disclosed in the above Detailed Description, the invention is not limited thereto but only by the scope of the appended claim.

Claims

1. bed frame including a pair of longitudinal extending hollow side rails (2) and a pair of transversely extending end rails extending between the side rails and a plurality of transversely extending metal slats (4) extending between said longitudinal side rails (2) **characterized in that** each said side rail (2) is provided with a plurality of slots (9) for the metal slat (4) to be inserted therein and engaged therewith; each said metal slat (4) is capable of being individually attached to and detached from a said slat (9) and comprises a hollow interior (8) with a first and second lateral opening (10) (12) near each of its end portions the first opening (10) being nearer the adjacent end of the metal slat (4) than the second opening (12); and each said slat (9) is further provided with a press and release mechanism (6) wherein said mechanism (6) is made up of a "U" shaped compressed spring wire (14) provided with a loop (14B) having two arms (14C, 14D) of different length extending therefrom, the longer arm (14C) having its terminal end (14A) bent to form an "L" shaped configuration to enable it to be inserted through a first said lateral opening (10) adjacent to the end of the metal slat (4) when inserted into the hollow interior of the metal slat (4) whilst the shorter arm (14D) rests on the inner surface (20) of the hollow metal slat (4) opposing the surface having the first and second openings (10, (12), said longer arm being fastened to the slat (9) with an insert (16) which is inserted through said second lateral opening (12) of the metal

slat (4) to facilitate application and transfer of pressure to depress the compressed spring wire (14) to thereby operate the terminal end (14A) thereof.

Patentansprüche

1. Bettrahmen, der ein Paar hohle Seitenschienen (2) aufweist, die sich in Längsrichtung erstrecken und ein Paar Endschienen, die sich zwischen den Seitenschienen in Querrichtung erstrecken sowie eine Vielzahl von Metallstäben (4), die sich in Querrichtung zwischen den längs verlaufenden Seitenschienen (2) erstrecken,
dadurch gekennzeichnet, dass
jede Seitenschiene (2) mit einer Vielzahl von Öffnungen (9) versehen ist, in welche die Metallstäbe (4) eingesetzt und eingerastet werden können;
jeder Metallstab (4) dazu eingerichtet ist, einzeln in der Öffnung (9) befestigt und aus dieser gelöst zu werden und einen hohlen Innenraum (8) aufweist, der eine erste und zweite seitliche Öffnung (10), (12) jeweils nahe den Endabschnitten besitzt, wobei sich die erste Öffnung (10) näher am nächstliegenden Ende des Metallstabs (4) befindet als die zweite Öffnung (12); und
jeder Metallstab (4) ferner mit einem Druckklinkmechanismus (6) versehen ist, wobei der Mechanismus (6) aus einem "U"-förmigen zusammengedrückten Federdraht (14) besteht, der über eine Schleife (14B) verfügt, von der sich zwei Arme (14C, 14D) mit unterschiedlicher Länge erstrecken, wobei das äußere Ende (14A) des längeren Arms (14C) zu einer "L"-förmigen Anordnung gebogen ist, so dass es durch die erste seitliche Öffnung (10) nahe dem Ende des Metallstabs (4) eingesetzt werden kann, wenn es in den hohlen Innenraum des Metallstabs (4) eingesetzt wird, während der kürzere Arm (14D) an der Innenfläche (20) des hohlen Metallstabs (4) gegenüber der Fläche anliegt, welche die erste und zweite Öffnung (10), (12) aufweist, wobei der längere Arm an dem Stab (4) mithilfe eines Einsatzstücks (16) befestigt wird, das durch die zweite seitliche Öffnung (12) des Metallstabs (4) eingesetzt wird, um die Anbringung zu erleichtern und Druck zu übertragen, damit der zusammengedrückte Federdraht (14) nach unten gedrückt werden kann und so das äußere Ende (14A) betätigt werden kann.

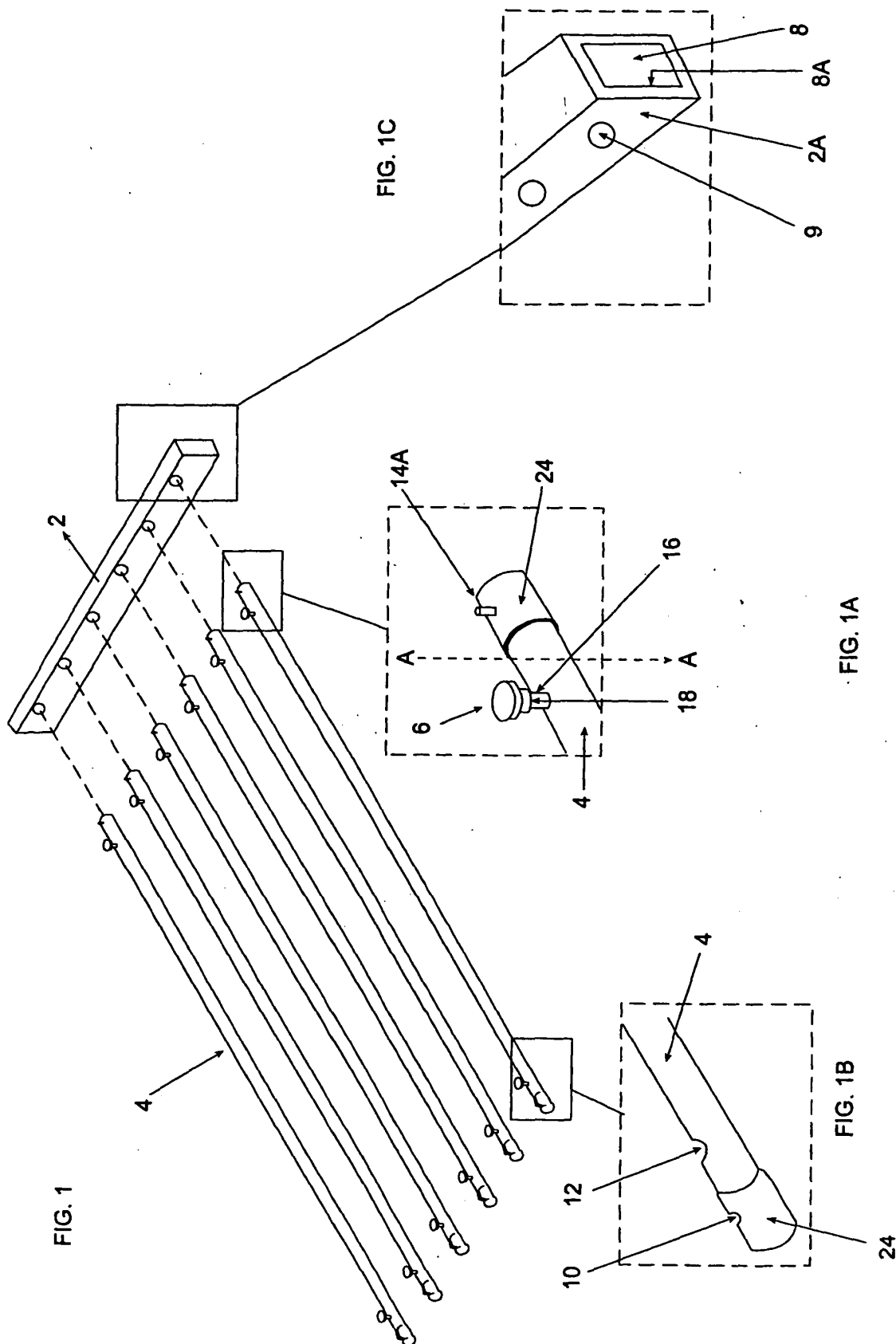
naux (2),

caractérisé en ce que

chaque dit rail latéral (2) est muni d'une pluralité de fentes (9) pour insérer la traverse de métal (4) à l'intérieur de celles-ci et la mettre en prise avec celles-ci ;
chaque dite traverse de métal (4) peut être individuellement attachée à une dite fente (9) et détachée de celle-ci, et comprend un intérieur creux (8) avec une première et une seconde ouverture latérale (10, 12) près de chacune de ses parties d'extrémité ; la première ouverture (10) étant plus proche de l'extrémité adjacente de la traverse de métal (4) que la seconde ouverture (12) ; chaque dite traverse (4) est en outre munie d'un mécanisme de pression et de libération (6) dans lequel ledit mécanisme (6) est constitué d'un fil à ressort comprimé en forme de "U" (14) muni d'une boucle (14B) ayant deux bras (14C, 14D) de longueur différente s'étendant à partir de celle-ci, le bras le plus long (14C) ayant son extrémité terminale (14A) pliée pour former une configuration en forme de "L" pour lui permettre d'être insérée à travers une dite première ouverture latérale (10) adjacente à l'extrémité de la traverse de métal (4) lorsqu'elle est insérée dans l'intérieur creux de la traverse de métal (4) alors que le bras le plus court (14D) repose sur la surface intérieure (20) de la traverse de métal creuse (4) opposée à la surface ayant les première et seconde ouvertures (10, 12), ledit bras le plus long étant fixé à la traverse (4) avec un insert (16) qui est inséré à travers ladite seconde ouverture latérale (12) de la traverse de métal (4) pour faciliter une application et un transfert de pression afin d'enfoncer le fil à ressort comprimé (14) pour ainsi actionner l'extrémité terminale (14) de celui-ci.

Revendications

1. Cadre de lit comprenant une paire de rails latéraux creux s'étendant longitudinalement (2) et une paire de rails d'extrémité s'étendant transversalement et s'étendant entre les rails latéraux, et une pluralité de traverses de métal s'étendant transversalement (4) et s'étendant entre lesdits rails latéraux longi-



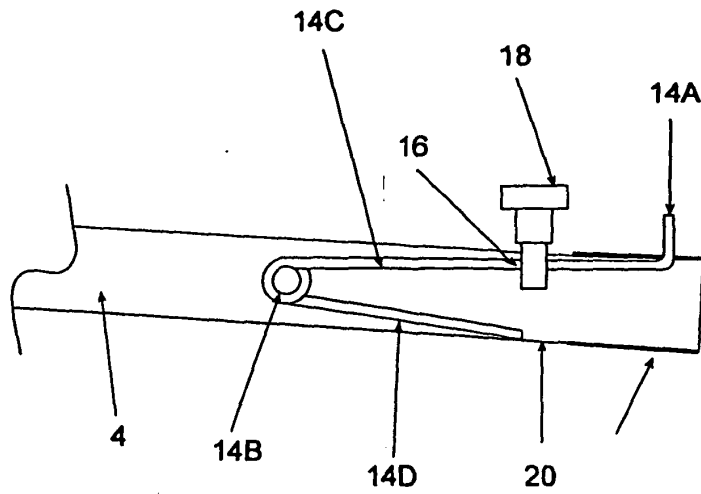


FIG. 2

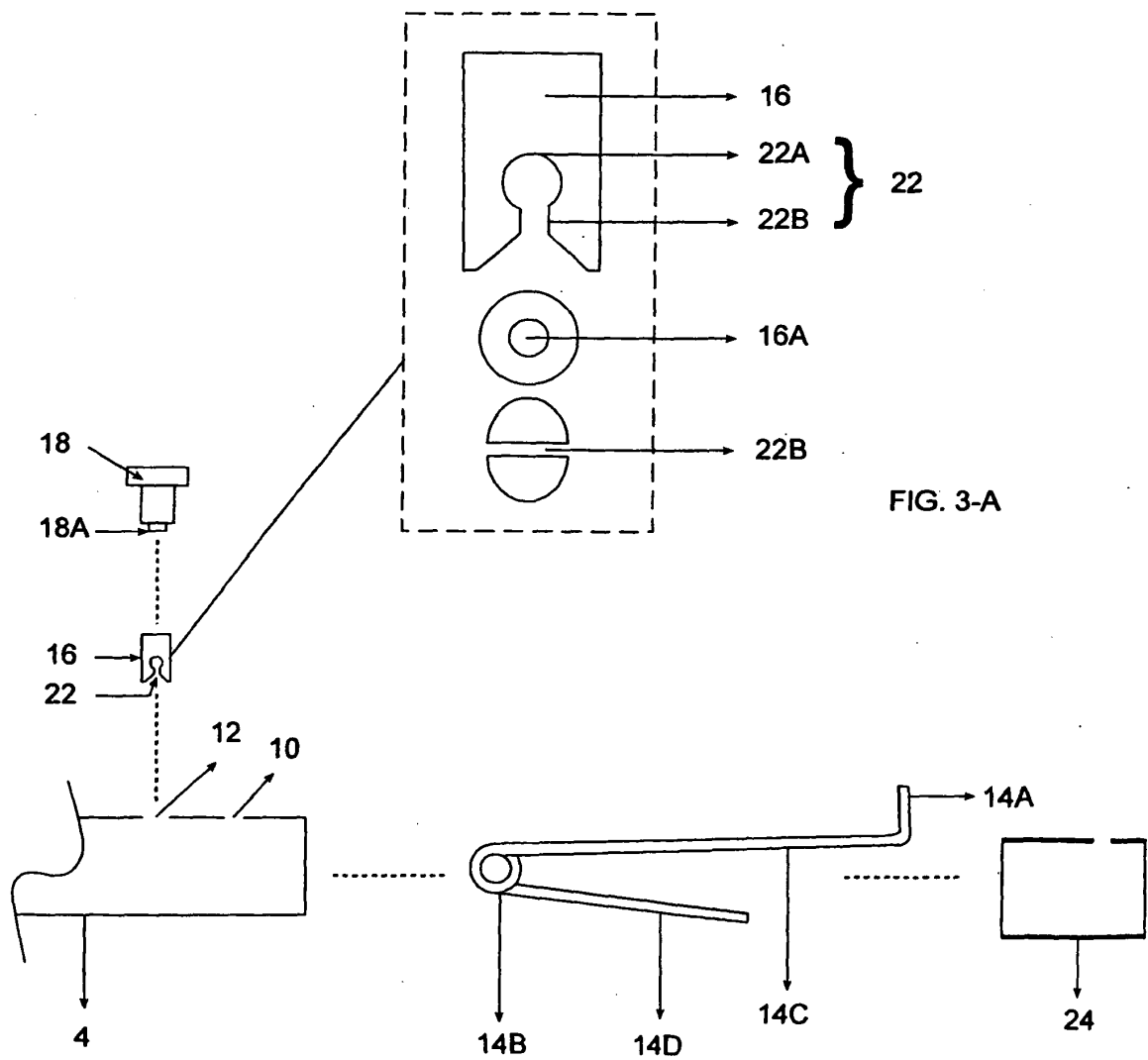


FIG. 3

