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(54) **SHELVING**

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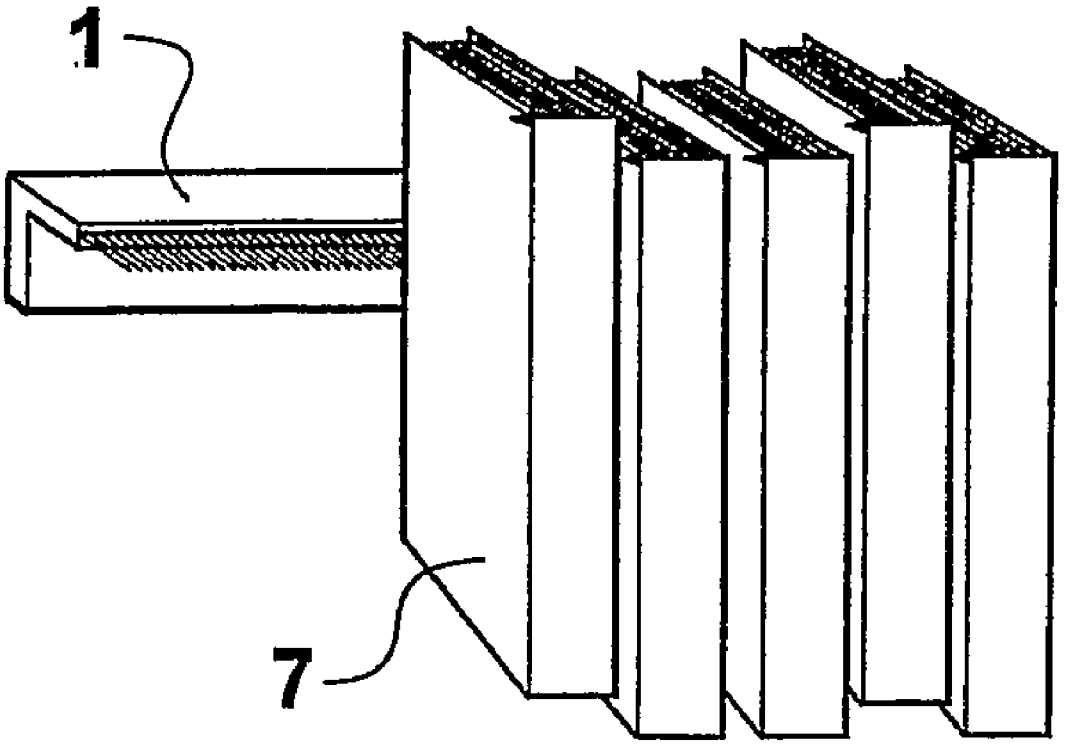
(57) **ABSTRACT**

A book or magazine shelving device (**1**), comprising a wall mountable bracket (**2**) having a comb-like book or magazine receiving member (**5**) with tapered teeth (**6**). The device holds books or magazines by gripping pages that are fed between the tapered teeth. The taper angle is in the range of 1.5 to 10.0 degrees.



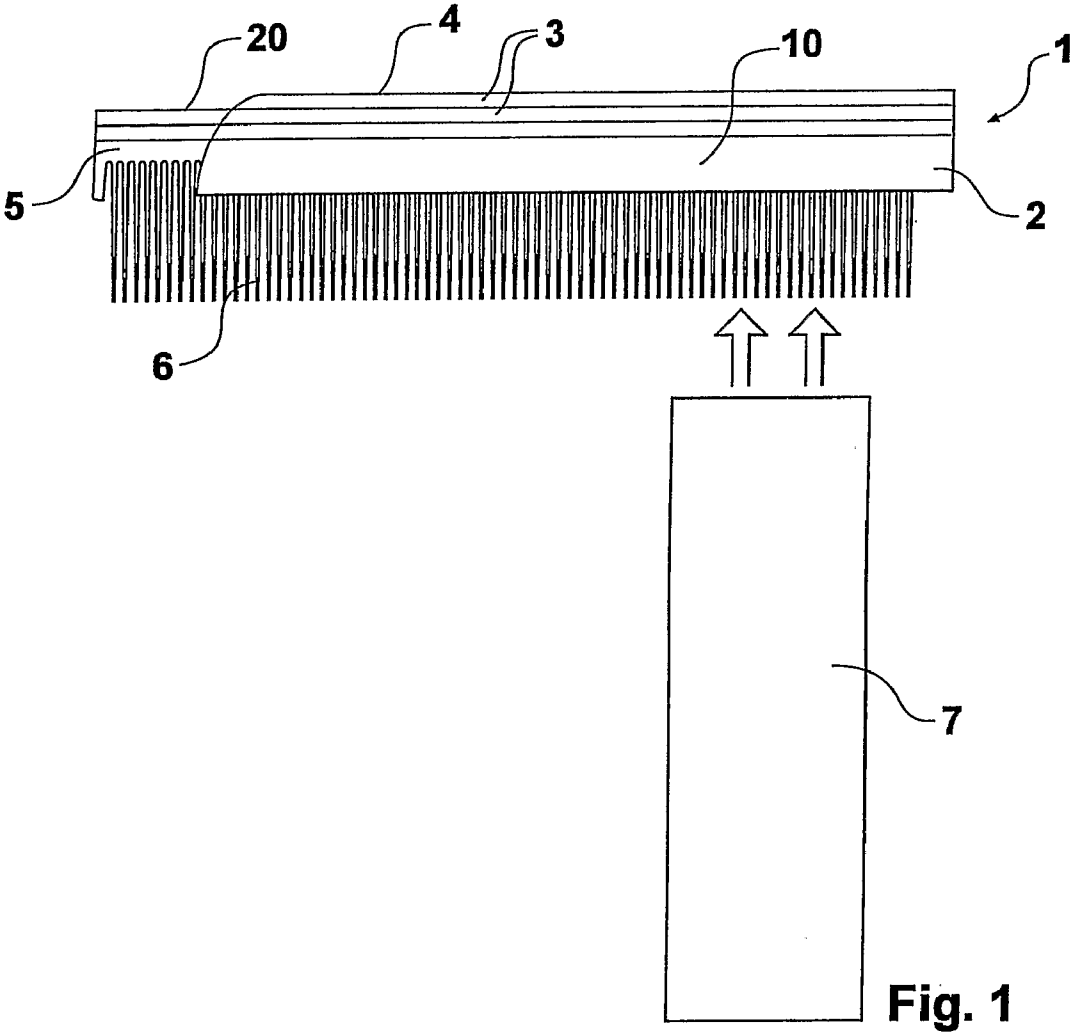


Fig. 1

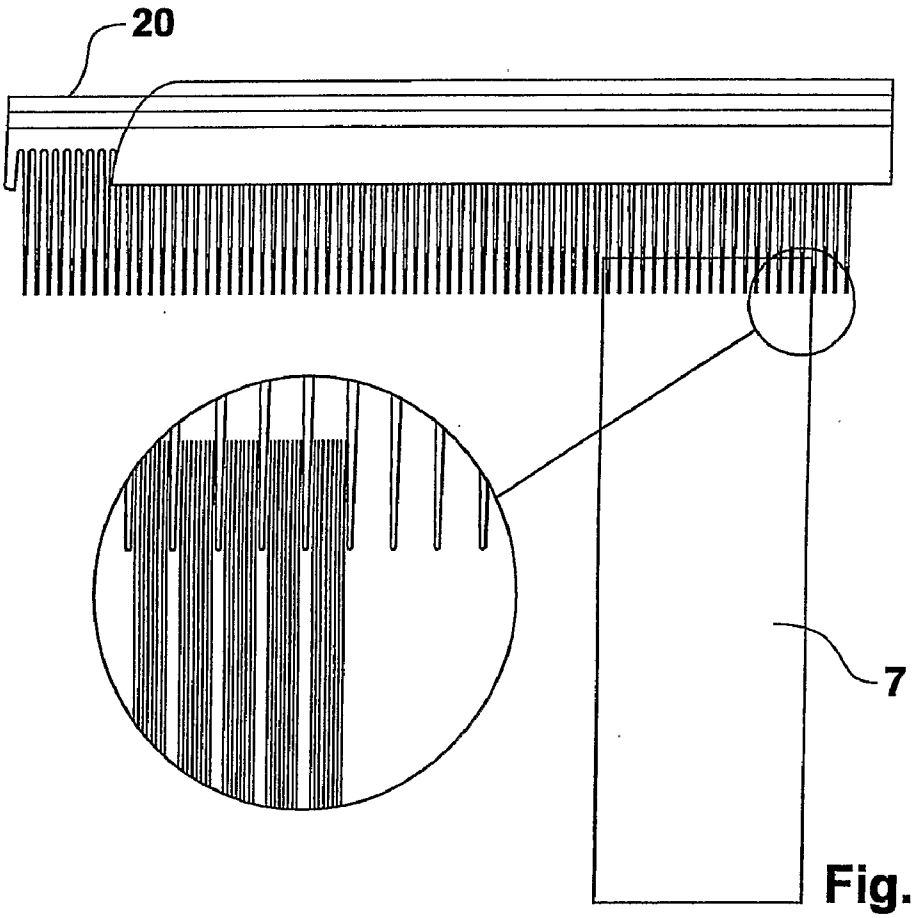


Fig. 2

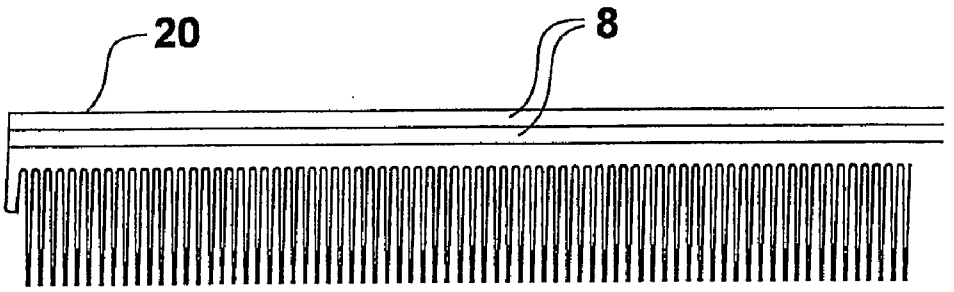


Fig. 3

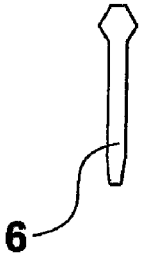


Fig. 4

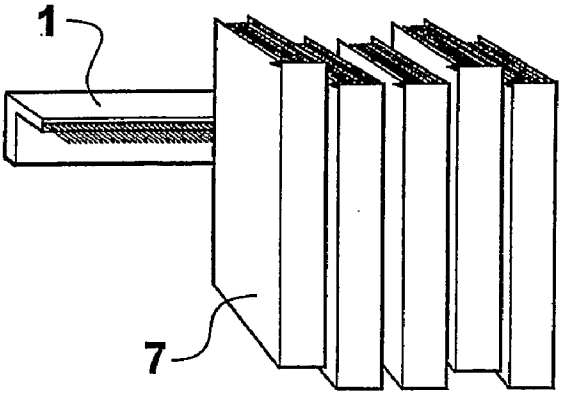
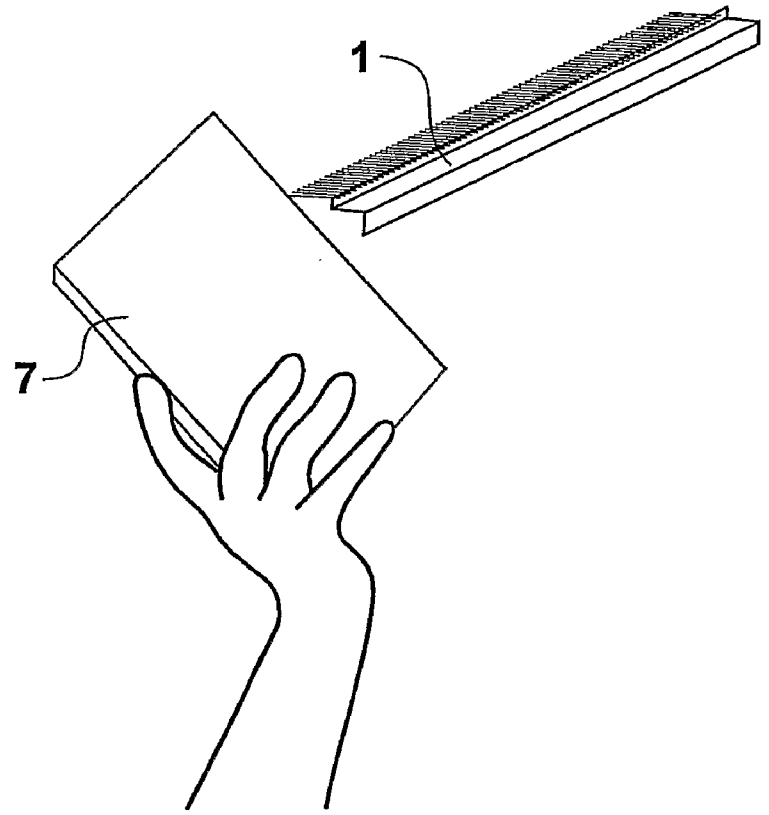


Fig. 5



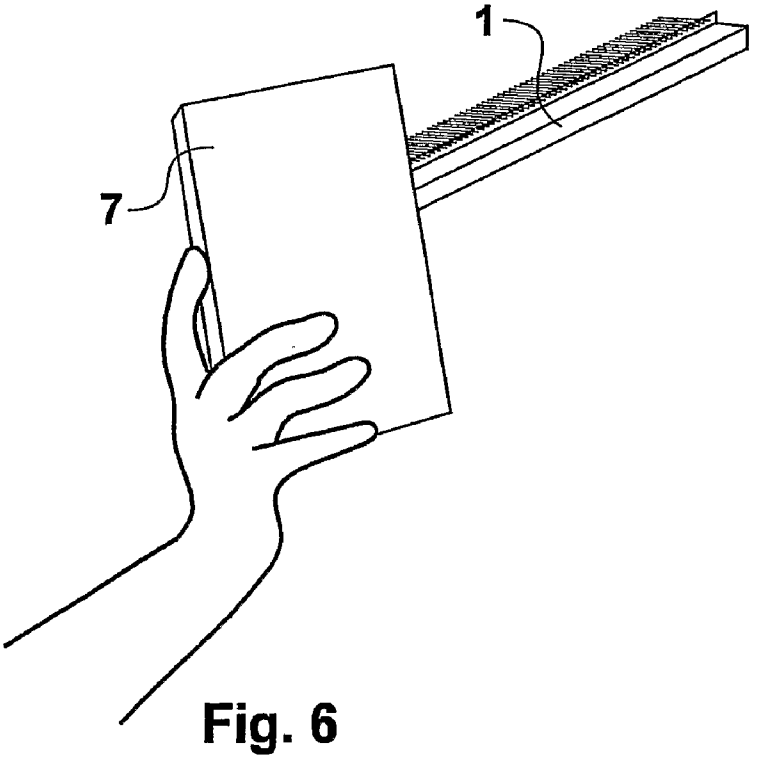


Fig. 6

SHELVING

FIELD OF THE INVENTION

[0001] The present invention relates to shelving apparatus for books or magazines and where it is intended to apply to books, it is intended to apply in particular but not exclusively to paper-back books.

BACKGROUND ART KNOWN TO THE APPLICANT

[0002] Shelving apparatus especially for books has usually involved at least one shelf that either forms part of a free standing bookcase or is permanently fixed to a wall via brackets. If each end of the shelf is not provided with an "upright" to enable books at the end of the shelf to be supported, then "uprights" in the form of heavy moveable bookends which are normally quite ornate in nature may be provided. These forms of shelving may be expensive or otherwise difficult to assemble and are highly visible.

[0003] It is, therefore, an object of the present invention to provide shelving apparatus that will provide consumers with a useful choice. Furthermore, whilst the present invention is embodied in several different aspects, it will be clear that each aspect is so linked as to form part of the same inventive concept.

STATEMENTS OF THE INVENTION

[0004] Accordingly, in a first aspect of the present invention, there is provided shelving apparatus or a literature organiser for books or magazines comprising a wall mountable bracket provided with one or more book or magazine receiving members, the or each member comprising a plurality of elongate, book or magazine receiving shafts, linked at their distal end to a shaft receiving member, each shaft being arranged in mutually and substantially completely overlying, spaced apart, parallel relationship to present a phalanx of book or magazine receiving shafts wherein the angle separating adjacent shafts is in the range of 1.50-10.00 degrees

[0005] This tends to alleviate the aforementioned problems as it enables a possibility of a far less visible shelving apparatus to be made available.

[0006] More preferably the angle separating adjacent shafts is 2.66 degrees.

[0007] Preferably, the book or magazine receiving shafts are tapered.

[0008] Preferably the shafts and shaft receiving members are integrally connected.

[0009] The materials used to form the book or magazine receiving member can be metal or metal alloy however, the preferred type of material for the formation of the book or magazine receiving member is plastics material.

[0010] More preferably the plastics material is polypropylene. As this material can be injection moulded, this method of manufacturing offers a cheap and ready method of entry into the formation of these book or magazine receiving members.

[0011] When viewed end on and concentric along their length the book or magazine receiving shafts could be circular, elliptical, kite or star shaped, rectangular, or possess any appropriate combination of these e.g one side circular the opposing side kite shaped, however preferably, the book or magazine receiving shafts are diamond shaped when viewed end on.

[0012] In order to provide the illusion of an almost invisible shelving system, the bracket can be relatively small, formed from clear plastics material (or if made of metal or a metal alloy, be so surface finished as to be able to readily accept a coat of paint that would match the existing painting scheme of the area that the shelving system is to be mounted to).

[0013] In addition, the or each book or magazine receiving members could also be so surface finished to enable them to receive a coat of paint, or it could be naturally 'coloured', however preferably, the or each book or magazine receiving member could be formed from clear, translucent or opaque plastics material.

[0014] In order for the shelving apparatus to work effectively, the gap separating adjacent shaft tip ends cannot be too small and it cannot be too large as it is the lateral forces exerted on the groups of pages on the book by the shafts through a combination of the taper angle and number of shafts embedded within the book that are key to the invention.

[0015] If there are too few shafts 'per unit book', then the force of gravity (if the shelving system is to be used in the manner illustrated in the figures) will outweigh the lateral forces and the book will simply fall to the ground.

[0016] Preferably therefore, the shortest distance separating adjacent proximal shaft tip ends lies in the range of 1-6 mm. More preferably, this shortest distance is substantially equal to 2 mm.

[0017] The book or magazine receiving shaft length for any given number of consecutive shafts is intended to be the same although "blocks" of shafts could have different lengths to provide a stepped alteration of shaft lengths within the or each book or magazine receiving member. Such an arrangement could allow for magazines to be stored on the section of the book or magazine receiving member containing the longer set of shafts whilst for example, paper back books could be stored on the shorter set of shafts. In any event, it should be noted that the shafts are tapered in mutually orthogonal directions

[0018] Of course the shelving apparatus could be so designed that once the bracket is mounted to for example, a wall or table edge, the relative position of the or each book or magazine receiving member with respect to the bracket once mounted could be such that the or each book or magazine receiving member lies in a vertical upwardly projecting plane enabling books and magazines to be tapped vertically downwards onto the shafts.

[0019] Then again, the arrangement could be such that the or each book or magazine receiving member projects substantially horizontally from a vertical surface (for example a wall) that the bracket has been fitted to. In such an arrangement, a book if its upper portion is tapped into a book or magazine receiving member (if there is only one) will tend after a while, under gravity to tilt and come to rest with its base abutting the vertical surface (e.g. a wall).

[0020] If, on the other hand there were two book or magazine receiving members in a spaced apart arrangement with one directly below the other, a book tapped into both members would remain in place without tilting.

[0021] Preferably however, the or each book or magazine receiving member projects substantially horizontally from a

vertical surface that the bracket has been fitted to and substantially parallel with the ground in its normal attitude of operation.

[0022] The bracket and the or each book or magazine receiving member could be integral, for example, the apparatus could be in the form of a single piece injection moulded finished product if formed from plastics material or if made of a metal or metal alloy, the apparatus could be 'plated' to provide a distinctive decorative metal finish (e.g chrome plated).

[0023] Alternatively the bracket and the or each book or magazine receiving member could be separate entities provided with complementary mating regions to enable one to connect with the other, there also being provided locking members to provide an 'interference', 'friction' or 'snap-fit' arrangement. Locking members possibly in the form of "Allen key" screws and complementary screw threads located at appropriate points on the apparatus to lock the or each book or magazine receiving member to the bracket could alternatively/also be supplied. In any event, the locking members could be located on either entity if two such separate entities are used.

[0024] Furthermore, these entities could but do not need to be formed from the same or same type of material, one could for example be metallic whilst one could be formed from a plastics material.

[0025] Alternatively, if the book or magazine receiving member is adapted to slidably engage with the bracket the total available length of the shafts need not be exposed. In other words, a portion of the shafts (probably that portion adjacent the shaft receiving member) might be hidden within the confines of the bracket.

[0026] This is particularly advantageous as the degree of lateral movement available to the shafts is going to be greater, the longer they are. The 'exposed' length of the shafts with this arrangement is going to be more flexible than an identical length of integral shafts that simply project from the bracket. To prevent undue damage to the shafts during use, they could also be partially protected by maintaining them with a pair of jaws such that if a book were to be tapped into the shafts, the penetration of the book would go no further than the start of the jaws thus minimising damage to the shelving apparatus or the book pages.

[0027] The book or magazine receiving shafts could be circular in cross section and concentric along their length given the taper. However this need not be the case, for example the shafts could be elliptical and concentric, rectangular and concentric or indeed posses a combination of straight and curved edges with the same centre thus providing preferably an arrangement where a radius in one direction of a shaft is different to a radius orthogonal to that direction.

[0028] This type of arrangement will add a degree of flexibility in one direction that will be greater in an orthogonal direction.

[0029] According to a second aspect of the present invention, the invention includes within its scope shelving apparatus substantially as herein described with reference to and/or as illustrated in the accompanying drawings.

[0030] The invention further includes within its scope books or magazines stowed in the shelving apparatus as specified herein.

[0031] According to a third aspect of the present invention there is provided a method of stowing books or magazines on a shelving apparatus of the type specified herein comprising the steps of:

fitting the shelving apparatus to a support and tapping books or magazines into a portion of the apparatus and subsequently allowing the weight of the stowed book or magazine to re-orientate the stowed book or magazine such that a portion of the book or magazine comes into contact with the support.

[0032] According to a fourth aspect of the present invention, the invention includes within its scope a method of stowing books or magazines on a shelving apparatus substantially as herein described with reference to and/or as illustrated in any appropriate selection or combination of the accompanying drawings.

[0033] The invention also consists in the parts, elements and features referred to or indicated herein, individually, collectively or in combination.

[0034] Also, where elements or features are mentioned herein and which have known equivalents in the art to which this invention relates, such known equivalents are deemed to be incorporated herein as if individually set forth.

[0035] Those skilled in the art to which the invention relates will see many variations not specifically mentioned herein which still come within the scope of the appended claims

BRIEF DESCRIPTION OF THE DRAWINGS

[0036] Preferred embodiments of the present invention will now be more particularly described by way of example only with reference to the accompanying drawings in which;

[0037] FIG. **1** illustrates a top view of a shelving apparatus fitted to a wall in accordance with the present invention and about to receive a paperback book.

[0038] FIG. **2** illustrates the same top view as that illustrated in FIG. **1** after it has received the paperback book with an inset showing how the pages of the book, the taper and the angle of the taper lock the book into position.

[0039] FIG. **3** illustrates a plan view of a book or magazine receiving member adapted to slidably engage with a bracket, both components forming the shelving apparatus.

[0040] FIG. **4** illustrates side and face views of one of the teeth that makes up the book or magazine receiving member illustrated in FIG. **3**.

[0041] FIG. **5** illustrates a front view of a shelving apparatus of the present invention fitted to a wall containing a number of paperback books in the manner dictated by the nature of the invention.

[0042] FIG. **6** illustrates a method of stowing books on a shelving apparatus of the present invention.

DESCRIPTION OF THE PREFFERED EMBODIMENT

[0043] Throughout the specification, the use of the term "integral" is intended to cover not only something which is formed from the outset as one single-entity component, but also anything which whilst being assembled from a plurality of initially disparately produced integers ends up as one overall and normally non-dismantleable structure.

[0044] A shelving apparatus generally referenced **1** comprises a wall mountable bracket **2** and a paperback book receiving member **5** adapted to slidably engage with and lock with the bracket **2**.

[0045] The wall bracket **2** comprises an elongate "single piece" aluminium extrusion that is substantially "L" shaped when seen in profile. The upright portion of the "L" shaped bracket **2** in its intended attitude of operation is provided with a number of evenly spaced apart circular apertures (not shown), each possessing a centre point that is substantially the same vertical distance from a line drawn from a top edge of the bracket **2**.

[0046] The apertures allow the bracket **2** to be fitted to a wall, edge of a table or other appropriate substantially vertical surface (none shown) through the use of screws (not shown) the shank of which is able to pass through the aperture.

[0047] The bottom or horizontal portion of the "L" shaped bracket comprises a pair of substantially parallel jaws **10** each linked to the other by five connecting sides of a hexagon (**3**,**4**), the distal wall of the hexagon **4** opposite the mouth of the jaws **10** lying flush with upright portion of the "L", the proximal opposing "sixth side" of the hexagon (**3**,**4**) being absent.

[0048] The paperback book receiving member **5** comprises a transparent, elongate, single piece injection moulded polypropylene comb, the spine **8** of which is shaped into a solid hexagonal block that is complementary to the hexagonal walls of the bottom of the bracket **2**. Projecting orthogonally from the centre of one face of the hexagonal spine **8** of the comb **5** is an elongate projection **20** located towards one end of the spine adapted to generate an interference fit once the paperback book receiving member **5** is connected to the wall bracket **2** to form the completed shelving apparatus **1**.

[0049] On the opposite surface of the spine **8** to that carrying the elongate projection **20**, are a plurality of elongate tapered diamond shaped, substantially equally spaced apart comb teeth **6** each of similar dimensions, said taper occurring in two orthogonal directions.

[0050] Each tooth **6** is provided with a 1.33 θ degree taper such that the thickest part of each tooth **6** or distal end is adjacent the spine **8**, whilst the exposed tip or proximal end of each tooth **6** as a result of its elliptical design has a radius of 0.175 mm along its intended line of flexibility and a radius of 0.820 mm orthogonal to the line of flexibility.

[0051] In addition, the distance separating the distal ends of adjacent teeth **6** is 2 mm. and the length of each tooth **6** from the distal end to the proximal tip is 18 mm.

[0052] In use, the bracket **2** is cut to the length of the wall and the paperback receiving member **5** is cut to a similar length and the latter is then slidably engaged with the other and the top portion of the projection **20** shears off as it enters the bracket **2**, causing the two components to lock together in an interference fit, to form the shelving apparatus **1**. The comb teeth **6** project from the jaws **10** of the bracket **2**.

[0053] The bracket **2** is then fitted to the wall via screws that pass through the apertures of the bracket **2** and into the wall. A paperback book **7** can now be presented pages first to the comb **5** in a sharp thrusting manner and the comb teeth **6** separate bundles of pages of the book **7** that progressively exert a stronger transverse force as the pages move into an ever reducing gap as they progress along the taper to lock the book **7** into place. The very small proximal tip radius of the comb teeth **6** tend to ensure minimal damage to the book **7** as the comb **5** penetrates the leaves of the book **7**.

[0054] The invention also consists in the parts, elements and features referred to or indicated herein, individually, collectively or in combination.

[0055] Also, where elements or features are mentioned herein and which have known equivalents in the art to which this invention relates, such known equivalents are deemed to be incorporated herein as if individually set forth. Those skilled in the art to which the invention relates will see many variations not specifically mentioned herein which still come within the scope of the appended claims

1. Shelving apparatus for books or magazines comprising a wall mountable bracket provided with one or more book magazine receiving members, the or each comprising a plurality of elongate, book or magazine receiving shafts, linked at their distal end to a shaft receiving member, each shaft being arranged in mutually and substantially completely overlying, spaced apart, parallel relationship to present a phalanx of book or magazine receiving shafts wherein the angle separating opposing surfaces on adjacent shafts is in the range of 1.50-10.00 degrees.

2. Apparatus as claimed in claim **1**, wherein the angle separating opposing surfaces of adjacent shafts is about 2.66 degrees.

3. Apparatus as claimed in claim **1**, wherein the book or magazine receiving shafts are tapered.

4. Apparatus as claimed in claim **1**, wherein the shafts and shaft receiving members are integrally connected.

5. Apparatus as claimed in claim **1**, wherein the material used for the formation of the book or magazine receiving member is plastics material.

6. Apparatus as claimed in claim **5**, wherein the plastics material is polypropylene.

7. Apparatus as claimed in claim **1**, wherein the book or magazine receiving shafts are diamond shaped when viewed end on.

8. Apparatus as claimed in claim **1**, wherein the or each book or magazine receiving member could be formed from clear, translucent or opaque plastics material.

9. Apparatus as claimed in claim **1**, wherein the shortest distance separating adjacent proximal shaft tip ends lies in the range of 1-6 mm.

10. Apparatus as claimed in claim **9**, wherein this shortest distance is substantially equal to 2 mm.

11. Apparatus as claimed in claim **1**, wherein the shafts are tapered in mutually orthogonal directions.

12. Apparatus as claimed in claim **1**, wherein the or each book or magazine receiving member projects substantially horizontally from a vertical surface that the bracket has been fitted to and substantially parallel with the ground in its normal attitude of operation.

13. A method of stowing books or magazines on a shelving apparatus of the type claimed in claim **1**, comprising the steps of fitting the shelving apparatus to a support and tapping books or magazines into a portion of the apparatus and subsequently allowing the weight of the stowed book or magazine to re-orientate the stowed book or magazine such that a portion of the book or magazine comes into contact with the support.

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