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[54] **CLIPBOARD AND NOVEL HINGE CONNECTIONS**

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[73] Assignee: **The Mead Corporation**, Dayton, Ohio

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[52] **U.S. Cl.** **24/67.5**, 108/43

[51] **Int. Cl.** **B42f 1/00**, A44b 21/00

[58] **Field of Search** ..... 108/43; 24/49 CC, 49 CP, 24/49 P, 67.3, 67.5, 67.7, 137 A, 252

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Attorney, Agent, or Firm—Biebel, French & Bugg

[57] **ABSTRACT**

A clipboard includes at least one hinge connection having first and second coupling members. The first member has an end portion bent over flush against itself to form an outwardly facing rounded bearing surface and an inwardly facing butt-end, and the second member has an inwardly facing dimple formed in a portion thereof and defining an oppositely facing projection. The dimple receives the rounded bearing surface, which is retained within the dimple by a split-tube having a first edge retained by the butt-end and a second edge retained by the projection.

15 Claims, 10 Drawing Figures

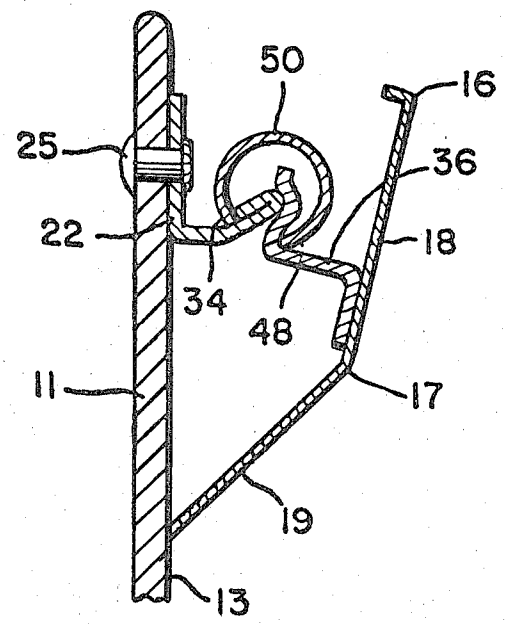


FIG-1

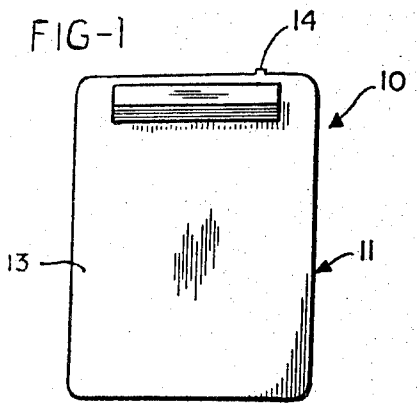


FIG-2

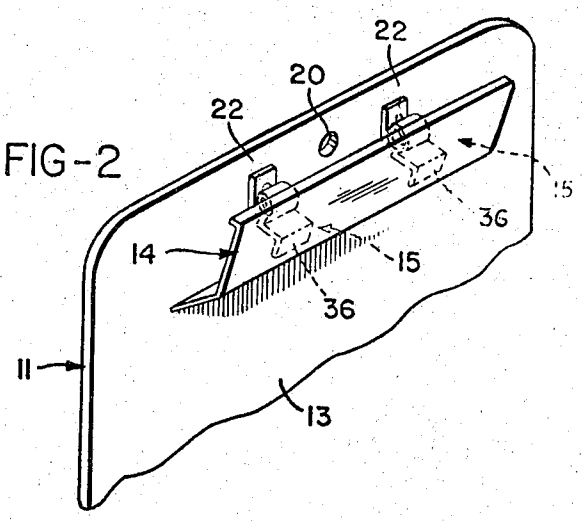


FIG-3

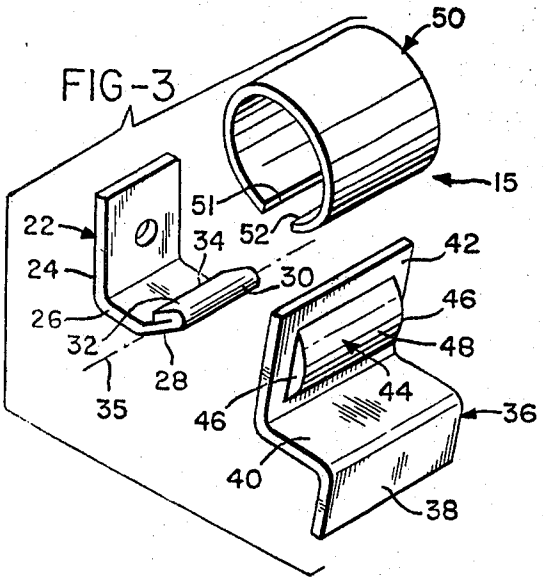


FIG-5

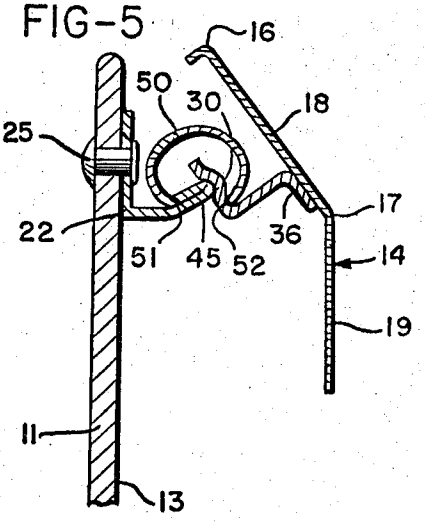


FIG-4

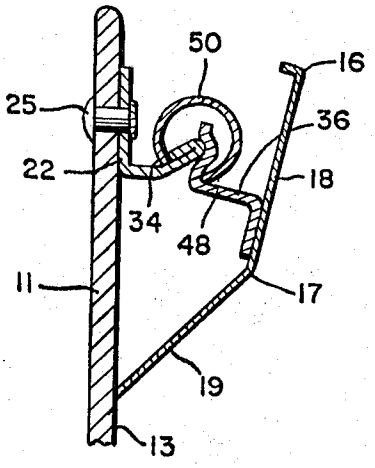


FIG-6

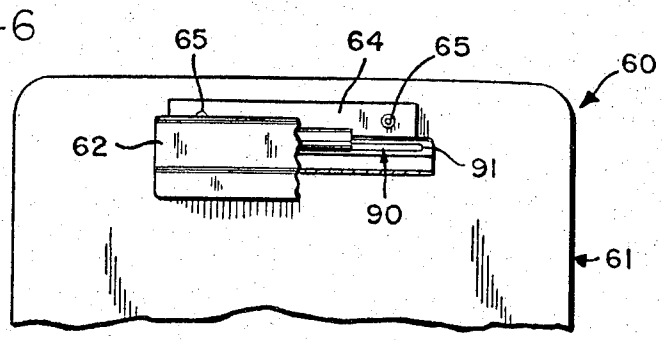


FIG-9

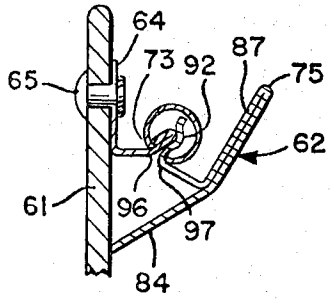


FIG-8

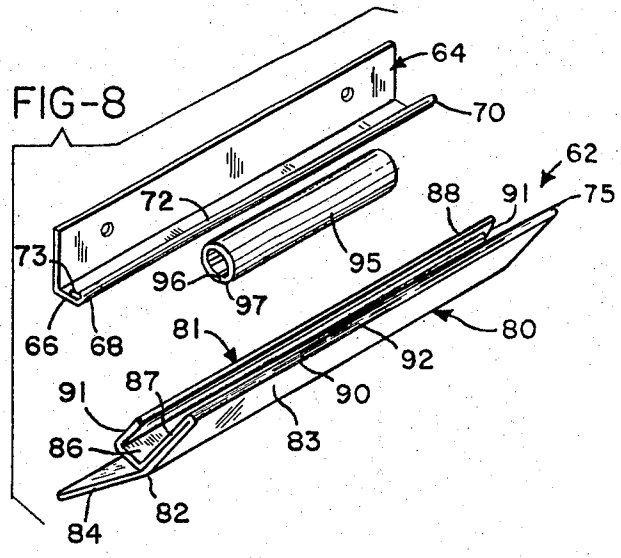


FIG-7

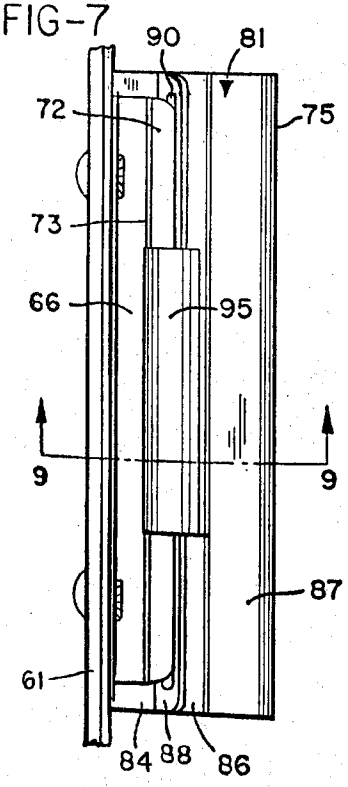
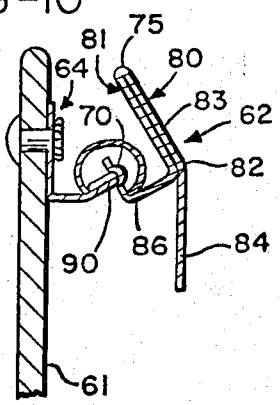


FIG-10



CLIPBOARD AND NOVEL HINGE CONNECTIONS

BACKGROUND OF THE INVENTION

In clipboards and the like it is desirable that the hinge devices have certain features and advantages. For example, to be economical to manufacture, the hinge devices should consist of a small number of parts; each part should require a minimum amount of material; and each part should be adapted for rapid manufacture, requiring a minimum amount of processing and handling and have tolerances which are easy to meet on a mass production basis. In addition, since clipboards are often purchased for their appearance, the parts should provide the clamping function in a simple and uncomplicated manner so as to project an efficient appearance to the purchaser.

The art discloses a number of patents for clipboards and the like in which hinge devices have been utilized. Split-tube springs have been used frequently, as disclosed in U.S. Pat. Nos. 1,474,102 of 1923, 1,632,455 of 1927, 1,668,912 of 1928; 1,743,718 of 1930; 2,302,568 of 1942; 2,455,515 of 1948; and 2,879,568 of 1959. Non-tubular springs have also been used, as disclosed in U.S. Pat. Nos. 1,431,306 of 1922, and 3,088,162 of 1963.

None of the structures in these patents provides all of the desirable features listed above, and accordingly it is the object of the present invention to provide a product having all of those features.

SUMMARY OF THE INVENTION

The present invention is directed to a clipboard having improved hinge connection means which provide a distinct advance in the art, primarily by being simple in construction and economical to manufacture. In general, the invention provides a clipboard having at least one hinge connection having first and second coupling members held together by a split-tube spring.

An L-shaped first coupling member has one leg fastened to a backboard panel and the other leg extending generally perpendicular to the backboard panel and having an upturned end portion. The upturned end portion is bent over flush against itself at its outer end to provide a rounded bearing surface, and also forms a folded portion flush against the end portion and having a butt-end spaced inwardly from the bearing surface.

The second coupling member is connected to the clip and includes an outer flange spaced from the clip and formed with an inwardly facing dimple in a portion thereof. The dimple also forms an oppositely facing projection on the outer flange, and rotatably receives the rounded bearing surface of the first coupling member to provide a novel pivot/socket combination. In addition, the dimple is preferably formed in a central portion of the outer flange and thereby defines abutment surfaces for retaining the bearing surface therein.

A first edge of a split-tube spring is received and retained by the butt-end of the first coupling member and the second edge thereof is received and retained behind the projection on the second coupling member, and the spring clamps the coupling members together and normally urges the clip rotatably on the first coupling member toward a retaining position in which a gripping portion of the clip is pressed against the backboard panel.

In one embodiment, a formed sheet of metal defines the clip, and a pair of narrow second coupling members are attached to the clip in spaced-apart relation and are clamped rotatably on a corresponding pair of relatively narrow first coupling members by a pair of narrow split-tube springs. In another embodiment, preferably for a relatively small clipboard, a formed sheet of metal or coupling clip defines the clip and also an integral second coupling member, and the integral second coupling member is clamped onto a relatively wide first coupling member by a split-tube spring. Other variations of these embodiments are also contemplated by the present invention.

The hinge connections of the present invention are described herein as being attached to the backboard panel of a clipboard, but it is to be understood that they could be used in a simple clamp or be attached to a wall, board, notebook or any other applicable surface.

DESCRIPTION OF THE DRAWING

FIG. **1** is an elevational view of a first embodiment of the present invention;

FIG. **2** is a partially broken away persective view of the top portion of the clipboard of FIG. **1**;

FIG. **3** is an exploded view of the first and second coupling members of the first embodiment, together with a split-tube spring therefor;

FIG. **4** is a sectional view through one of the hinge connections, showing the clip in its retaining position;

FIG. **5** is a sectional view through the same hinge connection of FIG. **4**, showing the clip in its non-retaining position;

FIG. **6** is a partially cutaway elevational view of a second embodiment of the present invention;

FIG. **7** is a top view of said second embodiment;

FIG. **8** is an exploded view of the first and second coupling members thereof, together with a split-tube spring therefor;

FIG. **9** is a sectional view of the hinge connection of the second embodiment taken along line **9—9** in FIG. **7**, showing the clip in its retaining position; and

FIG. **10** is a sectional view through the same hinge connection, showing the clip in its non-retaining position.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to FIG. **1**, a clipboard **10** of the present invention includes a rectangular clipboard panel **11**, which may be constructed of Masonite, fiberboard, or the like. As usual, the surface **13** of the panel serves as a writing surface, and in this embodiment may have dimensions of 9 inches × 12½ inches for accommodating paper sheets. A metal clip **14**, preferably of polished steel, is fastened to the panel **11** at its upper end by a pair of hinge connections **15** (FIG. **2**), and is laterally centered across the upper end of the panel. The clip **14** preferably has a **90°** bend at its upper edge **16** and about a 30° bend near the center **17** thereof to provide a rectangular handle portion **18** and a rectangular gripping portion **19**, respectively.

The hinge connections **15** are spaced laterally to either side of an opening **20** at the top of the panel which is useful for hanging the clipboard on a hook or the like. Each hinge connection **15** is simple in construc-

tion (FIG. 3), and includes a generally L-shaped first coupling member **22,** preferably consisting of a formed piece of steel, and having one leg **24** secured to the panel **11** by rivets **25** and the other leg **26** extending perpendicular to the panel **11** and having an upturned end portion **28.** The upturned end portion **28** is bent over flush against itself to form an outwardly facing rounded bearing surface **30** and an inwardly facing folded portion **32** having a butt-end **34** spaced inwardly a short distance from the bearing surface **30.** The outer bearing surface **30** provides a pivot surface having an axis along a line **35** passing laterally between the upturned end portion **28** and the folded portion **32.**

Each connection **15** also includes a generally Z-shaped second coupling member **36,** also consisting of a formed piece of steel, and having one end flange **38** welded or otherwise secured to the handle portion **18** of the clip **14.** The member **36** also includes a central flange **40** perpendicular to the flange **38,** and an outer end flange **42** extends upwardly perpendicular to the central flange **40** and spaced from the clip **14.** An inwardly facing dimple **44** is formed in only a central portion of flange **42,** as by a simple stamping or pressing process, and provides a socket or complementary bearing surface **45** for the outer bearing surface **30** of the first coupling member **22.** The dimple **44** also defines a pair of spaced apart abutment surfaces **46** and a rounded projection **48.** The abutment surfaces **46** prevent the bearing surface **30** from shifting laterally within the dimple.

The first and second coupling members **22** and **36** of each hinge connection are clamped together by a cylindrical split tube **50** constructed of spring steel and having a first edge **51** and a second edge **52.** When the members **22** and **36** are fitted together with the bearing surface **30** within the dimple **44,** the split-tube spring **50** is spread apart and the first edge **51** is retained on the first coupling member **22** by the butt-end **34** and the second edge **52** is retained on the second coupling member **36** by the projection **48** formed on the outer flange **42** by the formation of the dimple.

Referring to FIG. **4,** when the parts are assembled, the springs **50** normally urge the second coupling members **36** on the first coupling members in a clockwise direction toward a clip closing position in which the gripping portion **19** of the clip is pressed against the surface **13** of the panel **11.** By applying pressure to the handle portion **18,** a user may conveniently move the clip in the counterclockwise direction to a non-retaining position (FIG. **5**) in which the gripping portion **19** is spaced above the surface **13.** When moved in this direction, the second coupling members **36** rotate on the outer bearing surfaces **30** about the axis of line **35,** compressing the springs **50.** When the clip **14** is released, the springs **50** urge the second coupling members **36** rotatably in a clockwise direction again to their normal positions in which the gripping portion **18** is pressed against the surface **13.** The clip can be opened up until the upper edge **16** strikes the board and, where a stack of material is inserted beneath the clip, proper pressure is maintained on the material throughout the entire range.

A second embodiment of the invention is illustrated in FIGS. **6–10,** and is directed to a relatively small clipboard, on the order of 6 inches × 9 inches, wherein only a single hinge connection is used. Referring to FIGS. **6–8,** the clipboard **60** includes a rectangular clipboard panel **61** and a coupling clip **62,** preferably a formed sheet of polished steel, fastened to the panel **61** at its upper end. In this embodiment, a generally L-shaped first coupling member **64** is fastened to the top of the panel **61** by a pair of rivets **65,** and has the same configuration as that shown in FIGS. **1–5,** except that it is wider. The member **64** includes a leg **66** (FIG. **8**) which extends outwardly perpendicular to the panel **61** and has an upturned end portion **68** bent over flush against itself to form an outwardly facing rounded bearing surface **70** and an inwardly folded portion **72** having a butt-end **73** spaced inwardly a short distance from the bearing surface **70.**

The coupling clip **62** is bent 180° at point **75** to form a clip portion **80** and an integral coupling portion **81.** As shown in the drawing, the clip portion **80** has about 30° bend near the center **82** thereof to provide a rectangular handle portion **83** and a rectangular gripping portion **84,** respectively. The coupling portion **81** is generally U-shaped and includes a central portion **86** extending between a flush portion **87** bent flush against the handle **83** and an outer flange portion **88** spaced from the handle **83** and disposed perpendicular to the central portion **86.**

An inwardly facing dimple **70** is formed on a central portion of the flange **88** for receiving the bearing surface **70.** The dimple **90** defines a pair of spaced-apart abutment surfaces **91** for preventing the bearing surface **90** from shifting laterally therein, and also defines an outwardly facing projection **92.** The coupling clip **62** is rotatably clamped on the first coupling member **64** by a split-tube spring **95** which extends across a lateral portion of the clipboard. The spring **95** includes an inner edge **96** retained by the butt-end **73** on the first coupling member **64** and an outer edge **97** retained by the projection **92** on the coupling portion **81** of the coupling clip **62.**

It is apparent, therefore, that the clipboard **60** of the second embodiment operates in essentially the same manner as the clipboard **10** of the first embodiment. The spring **95** urges the coupling clip **62** rotatably on the coupling member **64** toward a clip closing portion (FIG. **9**). The coupling clip **62** may be moved to a non-retaining position (FIG. **10**) by the application of pressure to the handle portion **83,** and, when the coupling clip **62** is released, the spring **95** urges the coupling clip **62** rotatably in a clockwise direction to urge the gripping portion **84** against the backboard panel **61.**

The principles of the invention, as illustrated in the first and second embodiments described above, may also be combined in additional alternate forms of the invention. For example, the coupling clip of the second embodiment may be combined with a pair of narrow and spaced-apart first coupling members of the first embodiment, In such a case, each narrow coupling member would preferably be positioned with its rounded bearing surface adjacent one of the abutment surfaces of the coupling clip. In another form, the first coupling member of the second embodiment may be combined with a pair of relatively narrow and spaced-apart second coupling members of the first embodiment attached to a clip of the type shown in the first embodiment. In this case, to accommodate the bearing surface of the first coupling member, each narrow second coupling member would have only one abutment surface adjacent its dimple, at the lateral extremity

thereof, for preventing the bearing surface from shifting laterally outwardly therein.

From the foregoing description and accompanying drawings it is apparent that clipboards constructed according to the present invention provide desirable features and advantages. An important advantage is that the hinge connections provide simple and sturdy constructions. In the first embodiment, only two small spaced-apart hinge connections are required for fastening the clip to the backboard panel. In the second embodiment, one hinge connection is employed.

The unique pivot/socket combination utilized in both embodiments is well suited to mass production, since it is easy to construct and economical to manufacture, involving a minimum of materials and a small number of parts. It also presents an attractive and efficient appearance. The hinge connections can be used in a single clip, or as part of a clamping device attached to a blackboard, the back of a notebook or the like. Furthermore, a comparison with the structures of the prior art reveals the simplicity of the present invention, and the fact that it makes a distinct advance in the art.

While the forms of apparatus herein described constitute preferred embodiments of the invention, it is to be understood that the invention is not limited to these precise forms of apparatus, and that changes may be made therein without departing from the scope of the invention.

What is claimed is:

1. An improved clipboard comprising a backboard panel, a clip, and at least one hinge connection fastening said clip to said panel, said hinge connection including a first coupling member attached to said panel and having a leg extending outwardly from said panel with an upturned end portion bent over inwardly flush against itself to form an outer rounded bearing surface and a folded portion with a butt-end spaced inwardly from said bearing surface, a second coupling member on said clip and having an outer flange spaced from said clip, means forming an inwardly facing dimple in a central portion of said outer flange for receiving said rounded bearing surface and defining an outwardly facing projection thereon, and a split-tube spring having a first edge retained on said first coupling member by said butt-end and a second edge retained on said second coupling member by said projection for clamping said rounded bearing surface within said dimple and for normally urging said second coupling member rotatably on said first coupling member toward clip closing position.

2. The clipboard defined in claim **1** including a pair of laterally spaced-apart abutment surfaces adjacent said dimple for preventing said rounded bearing surfaces for shifting laterally therein.

3. The clipboard of claim **1** wherein said clip comprises a rectangular sheet of formed metal having a bend therein defining an upper handle portion and a lower gripping portion, said clip extending laterally across said panel.

4. The clipboard of claim **3** including at least two relatively narrow and spaced-apart second coupling members attached to said clip, each second coupling member having a dimple therein for receiving said rounded bearing surface of said first coupling member.

5. The clipboard of claim **4** wherein a second coupling member is positioned at each end of said first coupling member, and each such second coupling member includes an abutment surface adjacent the lateral extremity of its dimple for preventing said rounded bearing surface from shifting laterally therein.

6. The clipboard of claim **3** including at least two relatively narrow and spaced-apart first coupling members attached to said backboard panel, a corresponding member of relatively narrow and spaced-apart second coupling members attached to said clip, and a corresponding number of split-tube springs clamping said second coupling members on said first coupling members.

7. The clipboard of claim **3** wherein said sheet of formed metal forming said clip includes an integral portion forming said second coupling member, said integral portion including an outer flange with an inwardly facing dimple in a central portion thereof.

8. The clipboard of claim **7** including at least two relatively narrow and spaced-apart first coupling members attached to said backboard panel.

9. The clipboard of claim **8** wherein said outer flange includes a pair of spaced-apart abutment surfaces adjacent the lateral ends of said dimple, and each first coupling member is positioned with its rounded bearing surface adjacent one of said abutment surfaces.

10. An improved clipboard comprising a backboard panel, a clip, and a plurality of relatively narrow and spaced-apart hinge connections fastening said clip to said panel, each hinge connection including a generally L-shaped first coupling member having one leg attached to said panel and the other leg extending outwardly from said panel with an upturned end portion bent over inwardly flush against itself to form an outer rounded bearing surface and a folded portion with a butt-end spaced inwardly from said bearing surface, a generally Z-shaped second coupling member having one end flange attached to said clip and the other end flange spaced from said clip, means forming an inwardly facing dimple in a central portion of said other end flange for receiving said rounded bearing surface and defining an outwardly facing projection thereon, and a split-tube spring having a first edge retained on said first coupling member by said butt-end and a second edge retained on said second coupling member by said projection for clamping said rounded bearing surface within said dimple and for normally urging said second coupling member rotatably on said first coupling member toward clip closing position.

11. An improved clipboard comprising a backboard panel, at least one generally L-shaped coupling member having one leg attached to said panel and the other leg extending outwardly from said panel with an upturned end portion bent over inwardly flush against itself to form an outer rounded bearing surface and a folded portion with a butt-end spaced inwardly from said bearing surface, a coupling clip having a clip portion and an integral coupling portion, said coupling portion including a flange with means forming an inwardly facing dimple in a central portion thereof for receiving said rounded bearing surface and defining an outwardly facing projection thereon, and a split-tube spring having a first edge retained on said coupling member by said butt-end and a second edge retained on said coupling clip by said projection for clamping said rounded bearing surface within said dimple and for normally urging said coupling clip rotatably on said coupling member toward clip closing position.

12. An improved hinge connection for connecting a clip to a surface, comprising at least one first coupling member attached to said surface and having a flange with an upturned end portion extending perpendicular to said surface, means forming a rounded bearing surface on said upturned end portion, at least one second coupling member on said clip, said second coupling member including a central flange generally perpendicular to said clip and an outer flange generally perpendicular to said central flange, means forming a dimple in a central portion of said outer flange, said dimple defining a complimentary bearing surface for receiving said rounded bearing surface and forming abutment surface means for preventing said bearing surface from shifting laterally in said dimple, and at least one split-tube spring retained on said coupling members for clamping said rounded bearing surface within said dimple and for normally urging said second coupling member rotatably on said first coupling member toward clip closing position.

13. An improved hinge connection for connecting a clip to a surface, comprising at least one first coupling member attached to said surface and formed with a flange having an end portion extending outwardly from said structure and bent over inwardly flush against itself to form a rounded bearing surface and a folded portion having a butt-end spaced inwardly from said bearing surface, at least one second coupling member on said clip and formed with a flange having an inwardly facing dimple formed in a central portion thereof for rotatably receiving said rounded bearing surface therein, said dimple also defining a projection on said flange, and at least one split-tube spring having a first edge retained on said first coupling member by said butt-end and a second edge retained on said second coupling member by said projection, said spring clamping said rounded bearing surface within said dimple and normally urging said second coupling member rotatably on said first coupling member toward clip closing position.

14. An improved clip and hinge connection for a clipboard having a surface, comprising at least one coupling member attached to said surface and having a flange with an upturned end portion extending perpendicular to said surface, means forming a rounded bearing surface on said upturned end portion, a coupling clip including a clip portion and a coupling portion, said coupling portion including a central flange generally perpendicular to said clip portion and an outer flange generally perpendicular to said central flange, means forming a dimple in a central portion of said outer flange, said dimple defining a complementary bearing surface for receiving said rounded bearing surface and forming a pair of spaced apart abutment surfaces for preventing said bearing surface from shifting laterally in said dimple, and a split-tube spring retained on said coupling member and on said coupling portion for clamping said rounded bearing surface within said dimple and for normally urging said coupling clip rotatably on said coupling member toward clip closing position.

15. An improved clip and hinge connection for a clipboard having a surface, comprising at least one coupling member attached to said surface and formed with a flange having an end portion extending outwardly from said structure and bent over inwardly flush against itself to form a rounded bearing surface and a folded portion having a butt-end spaced inwardly from said bearing surface, a coupling clip including an integral clip portion and an integral coupling portion, said coupling portion formed with a flange having an inwardly facing dimple formed in a central portion thereof for rotatably receiving said rounded bearing surface therein, said dimple also defining a projection on said flange, and a split tube spring having a first edge retained on said coupling member by said butt-end and a second edge retained on said coupling portion by said projection, said spring clamping said rounded bearing surface within said dimple and normally urging said coupling clip rotatably on said coupling member toward clip closing position.

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