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FRICITION-TYPE BINDER

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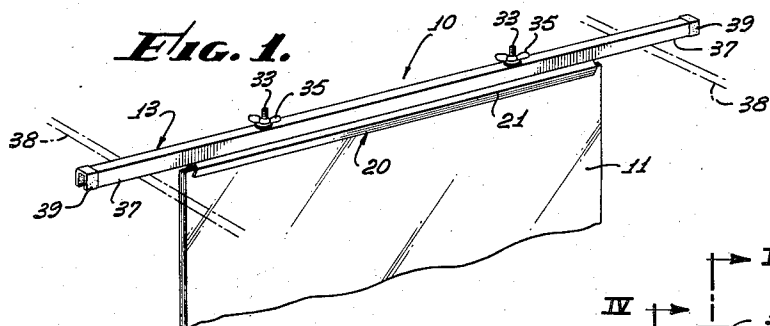
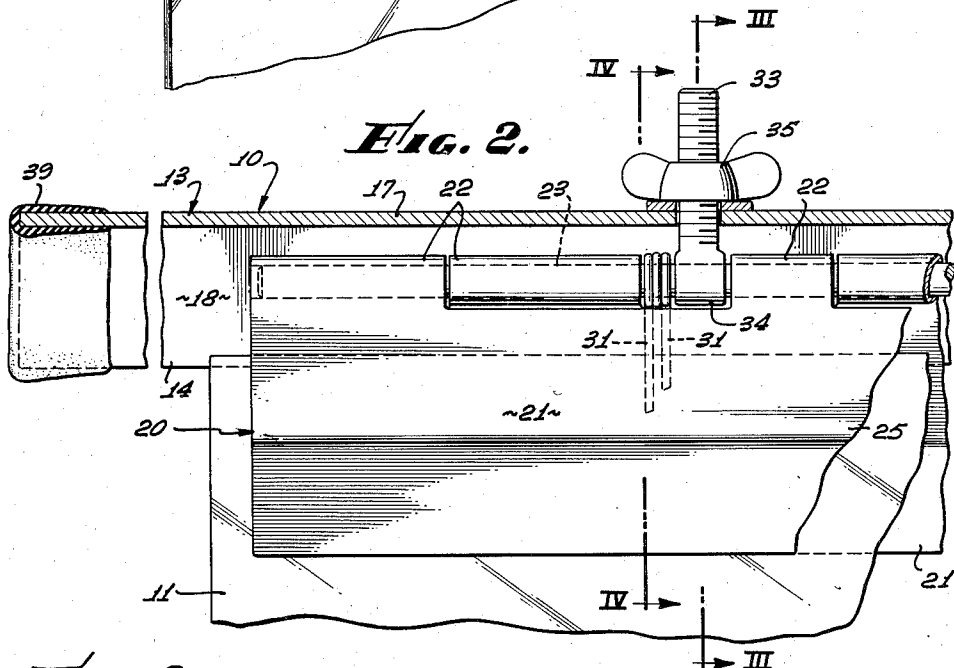


Fig. 3.

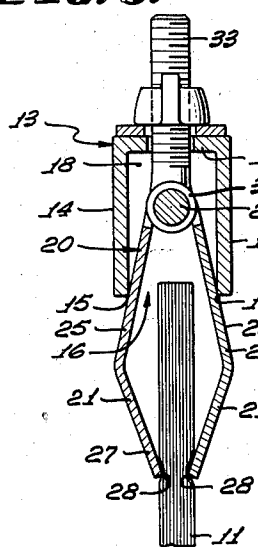
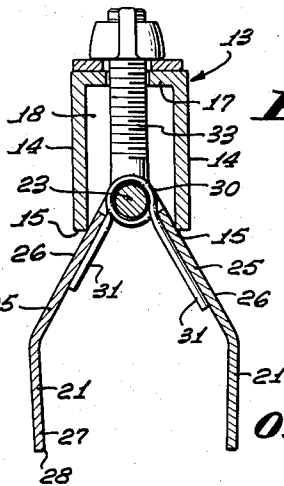


Fig. 4.

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FRICION-TYPE BINDER

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1 Claim. (Cl. 24—251)

This invention relates to a releasable, friction-type binder for holding one or more loose sheets of paper or like sheet material along an edge margin.

The invention contemplates a binder for holding engineering, architectural and construction plans, blueprints, specifications and the like. It is customary in engineering and architectural offices to assemble plans for a project into one group which may include a few sheets of blueprints or as many as 100 to 150 sheets of blueprints. Usually these sheets are large and are kept in racks when not in use. When they are used, they are laid upon a large, flat surface such as a table.

Prior proposed devices for binding such plans together into a group have usually included a temporary expedient such as a pair of elongated, slot-like wood members bolted together by spaced bolts. Each sheet or plan was perforated adjacent one edge margin and positioned on the bolts for binding. Obviously this arrangement of binding a large number of sheets has many disadvantages. Each time a sheet is added or deleted the bolts must be unfastened, a number of sheets must be lifted off the bolts, the added sheets inserted in the proper place, and then the sheets are assembled in reverse procedure. Such a method requires considerable time. Often the perforations in the sheets become torn with the result that a sheet may fall out of the assembled group. In such prior proposed devices, when plans were laid upon a table for study and sheets were turned, the upstanding bolts would often tear and pierce the turned sheets and cause damage to the prints.

It is the principal object of this invention to disclose and provide a simple, lightweight, friction-type binder for loose sheet material such as plans, specifications and the like which obviates the above-mentioned disadvantages and which includes many advantages not found in prior proposed binders known to me.

An object of this invention is to disclose and provide a lightweight, friction-type binder for one or more loose sheets of material wherein sheets may be added or deleted with facility.

Another object of this invention is to disclose and provide a friction-type binder wherein gripping means are provided which may readily adjustably hold one or more sheets of material.

A further object of this invention is to disclose and provide a friction-type binder in which the means for actuating the gripping means lies in the planar zone of the sheet material so that, when sheets are turned, tearing or damage to turned sheets is avoided and wherein exterior surfaces of the binder which might contact turned sheets are smooth.

A still further object of this invention is to disclose and provide a friction-type binder wherein gripping means are provided for virtually uniformly gripping edge margins of sheets over their entire length so as to firmly retain said sheets in assembly.

Generally speaking, this invention contemplates a friction-type, lightweight, simply constructed binder for hold-

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ing loose sheets in assembly along one edge margin thereof and includes a support member of U-shaped section defining a longitudinally extending recess and an opening to said recess. Within the recess is movably mounted a sheet-gripping means including gripping members provided with external, converging, longitudinally extending jaw portions and converging wedge portions slidably co-operable with edges of the support member defining the opening and pivotally interconnected within the recess. Means to move the gripping means within the recess to cause the jaw portions to open and close may include a pair of bolts pivotally connected to the gripping members and extended through the support member in the planar zone of the support member and sheets carried thereby for threaded engagement to a nut means for tightening and loosening the gripping members. Spring means are provided between the gripping members for biasing said members outwardly into spaced apart relation and against the edges of the support member.

Various other objects and advantages of this invention will be readily apparent from the following description of the drawings in which an exemplary embodiment of this invention is disclosed.

In the drawing:

Fig. 1 is a fragmentary perspective view of a binder embodying this invention supported on a rack and holding a plurality of loose sheets;

Fig. 2 is an enlarged fragmentary sectional view of the binder shown in Fig. 1;

Fig. 3 is a fragmentary sectional view taken in a transverse plane indicated by line III—III of Fig. 2; and

Fig. 4 is a fragmentary sectional view taken in the transverse plane indicated by line IV—IV of Fig. 2.

In the drawings, a binder generally indicated at 10 is illustrated as holding in assembled relation a plurality of loose sheets of paper 11 which may be blueprints, specifications, drawings and the like such as used in the building and construction industry.

The binder 10 may comprise an elongated, U-section, rigid support member 13 made of any suitable lightweight metal material such as aluminum. It is understood that other lightweight materials such as plastic and the like which can be made substantially rigid may be employed. The support member 13 includes longitudinally extending, parallel spaced walls 14 of uniform width and coextensive in length, said walls having parallel, longitudinal edges 15 defining an opening 16 and lying in a plane normal to the spaced planes of walls 14. Opposite opening 16, walls 14 may be connected by a longitudinally extending web 17 also co-extensive in length with walls 14, said web and walls defining a longitudinally extending recess 18. While walls 14 and web 17 are illustrated of solid construction, it is understood that openings may be provided in said walls and web to reduce the weight thereof as long as sufficient rigidity is provided in the support member.

Movably mounted within recess 18 is a sheet-gripping means generally indicated at 20. The sheet-gripping means 20 may comprise a companion pair of angle-section, opposed gripping members 21 which may be pivotally connected to each other within the recess by any suitable means. As illustrated, the pivotal connection may be of piano hinge type in which each gripping member 21 is provided with a plurality of spaced hinge sections 22 interleaved with hinge sections 22 of the other gripping member. A pivot pin 23 extends through said hinge sections.

The gripping members 21 of angle section include converging wedge portions 25 which carry the hinge sections 22 within recess 18 and which provide outer surfaces 26 for slidable contact with edges 15 of walls 14. Outer surfaces 26 lie in planes inclined to the spaced parallel

planes of walls 14, the angle of inclination being variable as the gripping members move inwardly and outwardly.

Outwardly of opening 16, wedge portions 26 are integral with converging jaw portions 27 which terminate in virtually parallel, longitudinally extending jaw edges 28 which are adapted to close into meeting contact with each other and to grip a sheet of material therebetween.

Spring means are provided for biasing the gripping members apart so that surfaces 26 on wedge portions 25 may normally contact edges 15. The spring means may comprise a pair of spaced spring wire elements 30 each turned about pivot pin 23 and having diverging spring portions 31 which bear against internal surfaces of wedge portions 25. Each spring element 30 may be conveniently positioned on pivot pin 23 by cutting away a portion of a hinge section 22.

Means for moving the gripping members inwardly and outwardly of recess 18 so as to cause closing or opening of jaw portions 27 may include a pair of spaced eyebolts 33 each having an eye 34 through which pivot pin 23 may pass to provide a pivotal connection thereto and each being mounted adjacent a spring element 30 and in space provided by cutting away a portion of a hinge section 22. Each eye-bolt 33 slidably projects through an aligned port in web 17 for threaded connection with a suitable securing or nut means 35. In this illustration nut means 35 may be a wing nut which may be readily grasped and turned. The axes of eye-bolts 33 lie parallel to and between the planes of walls 14. The nut means 35 is of a selected size so as to not extend beyond the planar zone defined by walls 14.

In this example, the elongated support member 13 is longer than the length of gripping members 21 and is provided with end portions 37 which extend a suitable selected distance beyond the ends of each of the gripping members 21. Each portion 37 provides convenient support means for spanning distance between parallel rack members 38 for supporting the binder and drawings held thereby in a vertical depending position as shown. It will be noted that the extremities of each end portion 37 are provided with a protective covering 39 of rubber, rubber composition or plastic material so as to cover the rough metal edge at such extremity to prevent marring or scratching of a desk surface upon which the plans may be laid for study. Such a covering may be conveniently applied to the extremities of end portions 37 by dipping into a suitable thermosetting plastic material.

When it is desired to insert a plurality of loose sheets of material into the binder of this invention, the sheets are substantially aligned as desired so that edges along one edge margin virtually coincide. The nut means 35 is loosened so that the gripping members 21 may be urged outwardly by the spring means 30, said surfaces 26 on wedge portion 25 slidably engaging edges 15. The spring means 30 are sufficiently strong to cause virtually automatic opening of the gripping members 21. The end margins of the sheets to be gripped are then inserted between the jaw edges 28 of the gripping members 21. Tightening of nut means 35 draws the gripping members inwardly into recess 18 and causes contraction of the jaw portion 27 by reason of the engagement of the wedge portions 25 with the edges 15 of the support member. The jaw edges 28 firmly and tightly grip margins of the sheet material along parallel, longitudinally extending lines.

When it is desired to delete or remove a sheet of material from the binder, nut means 35 are turned to loosen the grip of the gripping members on the sheets until the selected sheet may be readily withdrawn without disturbing the remainder of the sheets. It should be noted that the opposed, angle-section gripping mem-

bers provide ample space between the apices of the angle-section members so that jaw portions 27 may readily reach over edges of sheet material to firmly grip said sheet material along a line spaced from the edges. Thus, a large number of sheets of material may be retained in the binder illustrated.

It should be also noted that all of the external surfaces of the binder are relatively smooth and will not pierce or tear sheets which are folded over the binder. The wing nut 35 and bolt 33 lie within the planar zone defined by the support member and overfolded or turned sheets of material do not normally come in contact therewith. It is understood that bolt 33 and the nut means 35 may be enclosed in a smooth, external surfaced nut housing if so desired.

It is understood that various changes and modifications may be made in the binder disclosed above and which come within the spirit of this invention and all such changes and modifications coming within the scope of the appended claim are embraced thereby.

I claim:

A friction-type binder for loose paper sheets comprising, in combination: an elongated support member of channel-section including spaced parallel longitudinal walls of uniform section and having parallel longitudinal edges lying in a plane normal to said walls, a longitudinal web connecting said walls and defining therewith a longitudinally extending recess, said web having an opening therethrough; a sheet-gripping means movably mounted in said recess and including a pair of angle-section gripping members provided with converging jaw portions exterior of said recess and converging wedge portions provided with exterior surfaces cooperably engaged with said longitudinal edges; each of said gripping members having adjacent hinge sections which are interleaved and are provided within said recess at longitudinal edges of said wedge portions, certain of said adjacent hinge sections defining an enlarged spaced therebetween; a bolt having an apertured head positioned in said enlarged space and having a threaded shank passing through said opening in said web; an elongated hinge pin extending longitudinally through said hinge sections and apertured bolt head for pivotally interconnecting said gripping members and bolt within the recess; a spring positioned on said hinge pin in said enlarged space and having diverging spring portions which bear against the internal surfaces of said gripping members to urge said wedge portions into cooperable engagement with said longitudinal edges on the longitudinal walls of said support member, and a nut cooperable with said bolt shank and web for moving said bolt and gripping members in said recess to urge said jaw portions into and out of sheet-gripping positions.

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