Aug. 24, 1965 R. D. ATCHLEY 3,201,817

ERASER

Filed July 25, 1963

Fig. 1

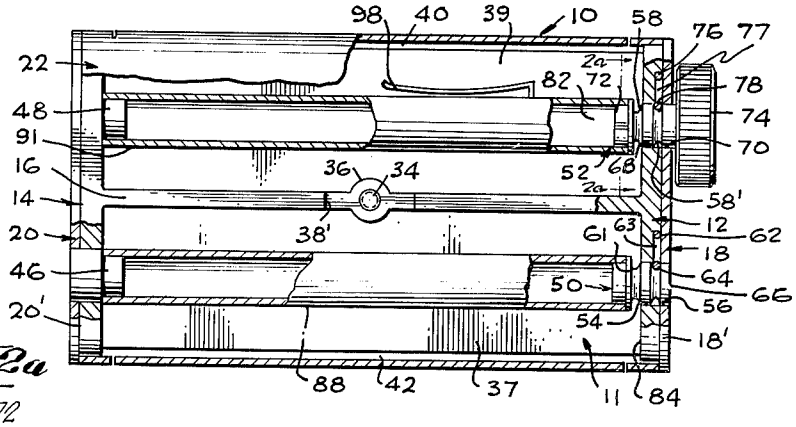


Fig. 2a

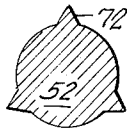


Fig. 2

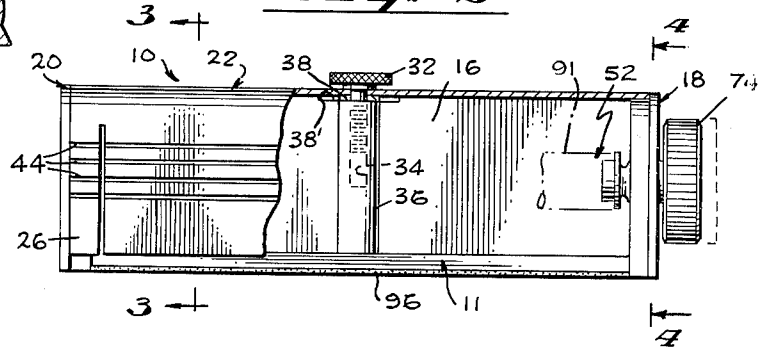


Fig. 3

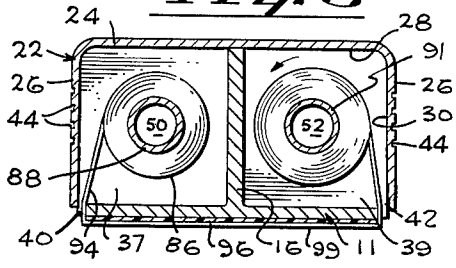


Fig. 4

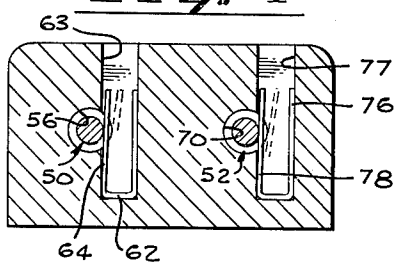
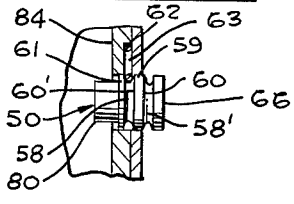


Fig. 5



RAYMOND D. ATCHLEY
INVENTOR.

BY Philip Sutton
Max Gilden

ATTORNEY

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ERASER

Raymond D. Atchley, Los Angeles, Calif., assignor to Techform Laboratories, Inc., Venice, Calif., a corporation of California

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This invention relates to a device for removing markings from a writing or marking surface, and is particularly concerned with an erasing device which is designed to remove powder markings from a smooth writing surface.

It is well known in the prior art to employ an erasing device, e.g., in the form of a felt or other type of cloth pad and a holder therefor, to remove chalk markings from conventional blackboards. However, this type of erasing tool becomes quickly clogged and loaded with chalk and dust particles, leaving a messy, streaked board when used, and requires cleaning at frequent intervals.

It is an object of this invention to design an eraser employing as the erasing medium a soft paper or cloth, used as a pad or roll in conjunction with a mechanical holder which can be operated to expose a fresh erasing surface when the paper or cloth becomes clogged following a series of erasing operations.

Another object is the provision of an erasing device as noted above, and which incorporates means for maintaining the clean roll of erasing paper or cloth free of contamination and exposure to the dust particles on the used portion or roll of the paper or cloth.

Still another object is the provision of simple, easily actuated means for mounting a clean roll of erasing paper or cloth in the holder and for removing a used roll of erasing medium from the holder.

Other objects and advantages will appear hereinafter.

The device of the invention comprises, in combination, a case, including a removable cover, means for mounting and supporting a clean roll of paper or cloth toweling for free rotation thereof, means for receiving the used towel portion in the form of a roll, and drive means associated with the last-mentioned means for feeding the toweling, as desired, along an outer surface of the case, against which the toweling is supported, onto the used roll. Such outer surface of the case is usually covered with a compliant material such as soft belt, and the exposed towel portion in contact with such compliant surface serves as the erasing medium. Thus, when the exposed towel portion becomes dirty or impregnated with dust, e.g., from markings on a writing surface, the drive means can be actuated to feed this used portion onto the used roll and to expose a clean portion of toweling for use. When a roll becomes used up, it is readily removed and a clean roll is placed in position for feeding successive portions into operative cleaning relation, as described above.

According to one feature of the invention, separate, substantially completely enclosed compartments are provided for the clean roll of paper or cloth toweling and for the used or dirty portion of toweling. In this manner, substantially no dust or powder, present on the used portion of toweling in one compartment, is transferred to the clean roll of toweling in the other compartment.

As another feature of the invention, mounting spindles of a simple retractable design are provided for mounting the clean and used rolls of toweling, whereby in operative position the spindles are in the forward position within the case, and in the retracted position the spindles are withdrawn outwardly to permit removal of the core members upon which the clean and used towel portions are mounted. One of the spindles for mounting the roll of used toweling has a knob thereon, to drive such spindle and to wind the used towel portions thereon, said drive

spindle carrying a series of grippers to grip the core on which such used towel portions are wound for rotation of such core with the drive spindle.

The invention will be more readily understood by reference to the description below of a preferred embodiment taken in connection with the accompanying drawing, wherein:

FIG. 1 is a plan view of the eraser of the invention, with the cover broken away and with parts in section;

FIG. 2 is a side elevation of the device of FIG. 1, partly broken away;

FIG. 2*a* is a section on line 2*a*—2*a* of FIG. 1;

FIG. 3 is a section taken on line 3—3 of FIG. 2, showing a clean roll and a used roll of paper toweling in position in the device;

FIG. 4 is a view taken on line 4—4 of FIG. 2, partly sectioned; and

FIG. 5 is a detail showing the position of one of the retractable spindles in its outer retracted position.

Referring to the drawing, the eraser of the invention comprises a frame 10 having a bottom 11, a pair of vertical integral end walls 12 and 14, and a central vertical partition or wall 16. Partition 16 spans the length of the eraser and is connected integrally to both end walls 12 and 14, and has a height substantially equal to the height of such end walls. End wall 12 carries an outer plate 18, and end wall 14 carries an outer plate 20, both plates forming an outwardly extending lip 18' and 20' around the side edges and top edge of plates 18 and 20, respectively.

A cover 22, having a top 24 and sides 26, is designed to fit over the frame 10 to enclose same. The end portions of the cover rest against the top edge 28 and the side edges 30 of each of the end walls 12 and 14, and the outer ends of the cover abut the lips 18' and 20' formed by the outer plates 18 and 20. Thus, the lips 18' and 20' serve to center the cover on the frame, and when so centered in position, a knurled screw 32, provided at the center of the cover, is aligned with an internally threaded aperture 34 formed in a boss 36 in the center of the partition 16, and by turning the screw down against the washer 38, the cover is in tight fixed position on the frame 10. A notch 38' is provided in the top of partition 16 adjacent aperture 34 to accommodate washer 38.

It will be seen that when the cover is turned down tightly on the frame, viewing FIGS. 2 and 3, the partition 16 forms two completely enclosed compartments, 37 and 39, in which the clean and soiled rolls of paper toweling used as erasing medium, are disposed, as described below. However, there is sufficient clearance between the lower edges of the cover and the adjacent longitudinal edges of the bottom 12 of the frame to form a pair of longitudinal slots 40 and 42 for passage of the web of paper toweling therethrough, as described in detail below. The sides 26 of the cover are grooved at 44 to facilitate gripping the eraser with the hand.

One of the end walls 14 of the eraser carries a pair of fixed cylindrical protrusions or plugs, 46 and 48, on opposite sides of the partition 16, the member 46 being centrally mounted in compartment 37 and the member 48 centrally mounted in compartment 39. Mounted on the opposite end wall 12 is a retractable spindle 50 in axial alignment with cylindrical plug 46 and a retractable spindle 52 in axial alignment with plug 48.

Spindle 50 is mounted for limited axial motion in bores 54 and 56, respectively, of the end wall 12 and the adjacent plate 18. Bores 54 and 56 are of a diameter slightly larger than the diameter of spindle 50, so as to permit slideable movement of the spindle within said bores. Spindle 50 is provided with a pair of spaced

peripheral grooves 58 and 58' (see FIG. 5), the shoulders on the intermediate spindle portion 59 adjacent said grooves being rounded off as at 60 and 60', for a purpose pointed out hereinafter. A flanged 61 is provided on the spindle adjacent the groove 58.

A U-shaped or hairpin spring 62 (see FIG. 4) is mounted in a vertical groove 63 formed from a recess within plate 12 in a plane parallel to the plate and the outer plate 18. When the spindle 50 is in its forward operative position as shown in FIG. 1, the free leg 64 snaps into the outer groove 58' of spindle 50, locking it in this position against axial displacement. When it is desired to retract spindle 50, the latter is urged outwardly to dislodge leg 64 of the spring from groove 58'; and, as the spindle 50 is retracted, the leg 64 of the spring rides onto the rounded shoulder position 60 adjacent groove 58' and onto the intermediate portion 59 of the spindle, as indicated in dotted lines in FIG. 4, and then snaps into the inner groove 58 of the spindle, when the latter has reached the retracted position shown in FIG. 5, holding it in such position against further axial displacement. The flange 61 insures against further outward displacement of spindle 50, preventing the pulling of the spindle completely out of the bores 54 and 56.

When it is desired to move the spindle 50 inwardly to its position shown in FIG. 1, the spindle is pushed forward from its position shown in FIG. 5, urging the leg 64 of the spring 62 out of groove 58' and along the curved shoulder 60' and the intermediate spindle portion 59, until spring leg 64 snaps into the outer groove 58', the normal operative position of spindle 50 shown in FIG. 1. In this position, it will be noted that the outer end 66 of spindle 50 is flush with the outer surface of plate 18, making for a smooth exterior surface appearance when the spindle 50 is in such operative position.

The U-shaped spring detent feature described above has several distinct advantages, in addition to its simplicity. In the first place, spring 62 is self retaining within groove 63 since the leg 64 is always bent inwardly at least a small amount even when it is riding in groove 58 or 58' of spindle 50, thus maintaining the spring in position at the bottom of the retaining groove 63. Also, the spring provides a drag against free rotation of the spindle 50 due to frictional contact of the spring leg 64 riding in the grooves of the spindle, and of course the spring functions to lock the spindle in either its inner or its retracted position.

The drive spindle 52 is mounted in bores 68 and 70 of end wall 12 and of plate 18, respectively, such bores having a diameter somewhat larger than the diameter of spindle 52, to permit axial displacement of such spindle in said bores. It will be noted that spindle 52 has a construction similar to spindle 50, and including inner and outer peripheral grooves 58 and 58', except that drive spindle 52 also carries on its inner portion a series of fins or grippers 72 peripherally spaced about the spindle, and the outer end of the spindle is provided with a knurled knob 74 for manually rotating such spindle. A second U-shaped spring 76, similar in construction to spring 62, is mounted in a groove 77, formed by a recess within end wall 12 in a plane parallel thereto, adjacent the bores 68 and 70, and the plate 18 as seen in FIG. 4, the free leg 78 of such spring adapted selectively to snap into grooves 58 and 58' of spindle 52.

Thus, in the inner operative position of spindle 52 shown in FIG. 1, the leg 78 of spring 76 rides in the outer groove 58' of spindle 52, locking it against axial displacement, but permitting rotation of such spindle. When spindle 52 is pulled outwardly, and when it reaches the retracted position, the leg 78 of spring 76 snaps into the inner groove 58, locking the spindle against further outward displacement.

In operation, the cover 22 is removed by first loosening the nut 32, and the spindles 50 and 52 are urged to their retracted positions, illustrated in FIGS. 2 and 5. In this retracted position, it will be seen that small inner end portions 80 and 82, of spindles 50 and 52, respectively, protrude inwardly beyond the inner surface 84 of end wall 12. A clean roll of paper or cloth toweling 86, carried on a core 88, e.g., of cardboard composition, is mounted in compartment 37, in the following manner. The core 88 has an internal diameter slightly larger than the external diameter of the cylindrical button 46 and the inner end portion 80 of spindle 50, and the opposite ends of the core 88 are positioned over members 46 and 80. Spindle 50 is then pushed inwardly to the position shown in FIG. 1, so that members 46 and 50 fully support the roll 86 in compartment 37, and permitting rotation of the roll of toweling 86 and the core 88 on these end supports.

With the spindle 52 in the retracted position shown in dotted lines in FIG. 2, a simple core 91 of construction similar to core 88, and having an internal diameter slightly larger than cylindrical button 48 and the inner end portion 82 of spindle 52, is mounted at one end over button 48 and at the other end over the grippers 72 on member 82. The spindle 52 is then pushed inwardly to the retracted position shown in FIG. 1, so that the core 91 is fully supported on members 48 and 52. When the knob 74 is manually rotated, the core 91 rotates therewith, due to frictional engagement between the core and spindle, provided by the grippers 72.

The web 94 of the roll of paper or cloth toweling 86 is then passsed through the slot 40 and over the surface of a compliant pad of material 96, such as soft rubber, cemented or otherwise affixed to the exterior surface of the bottom 11. The web 94 is then passed through the slot 42, and the end of the web is then connected to the core 91 in compartment 39, as by catching the end of the web in a spring 98 on core 91. If desired, the end of the web 94 alternatively can be attached to core 91 by means of an adhesive. The cover 22 is then replaced on the unit, and the nut 32 turned down to lock the cover in position, as shown in FIG. 2.

For use, the unit is grasped in the hand, the fingers and thumb gripping the grooved sides 26 of the cover. The surface 99 of the web of erasing towel adjacent the compliant pad 96 is the medium used for wiping a marking surface to erase chalk or other powdered markings therefrom, pad 96 functioning as a compliant backing. When the exposed used portion of toweling 99 has become clogged with dust or powder, the knob 74 of drive spindle 52 is rotated in the direction indicated by the arrow in FIG. 3, an amount just sufficient to remove the used portion 99 of toweling, and to expose the next successive portion of clean towel webbing adjacent the pad 96. This mode of operation is repeated until the entire roll of clean towel 86 has been consumed, and the soiled toweling completely rolled onto the core 91.

It will be noted that throughout the period of use, the used towel portion or used roll on core 91 in compartment 39 is completely separated from the clean roll of toweling 86 in compartment 37 by the partition 16, and no loose powder or dirt particles in the webbing of the used roll can be transmitted to the clean roll 86 to soil same, even though the eraser is subjected to rough handling during use.

During use of the eraser, with the spindles 50 and 52 in the inner operative position, as shown in FIGS. 1 and 2, the eraser has a smooth unobstructed exterior surface, except for the protruding knob 74 on the drive spindle, and screw 32.

To remove the soiled roll of toweling and replace the empty core 88 in compartment 37 with a new, clean roll, the cover 22 is removed, spindles 50 and 52 are retracted to their positions illustrated in FIGS. 2 and 5, the core 91, with the soiled roll of toweling, is removed from member 48 and the drive spindle 52, and empty core 88 is removed from member 46 and spindle 50. The device is now ready to receive a new clean roll of toweling in compartment 37 and a new core 91 in compartment 39

for winding the used toweling thereon, as described above.

While I have described particular embodiments of my invention for the purpose of illustration, it should be understood that various modifications and adaptations thereof may be made within the spirit of the invention, as set forth in the appended claims.

I claim:

1. An eraser structure which comprises a case having a pair of opposite walls and a bottom portion, a cover closing said case, a partition traversing the interior of said case and connected at opposite ends to said walls and connected along its lower edge to said bottom portion, said partition with said cover on said case forming a pair of separate compartments in said case, a first fixed cylindrical plug mounted on one of said walls in one of said compartments, a first retractable spindle mounted coaxially of said first plug on the second wall of said case in said one compartment, a second fixed cylindrical plug mounted on said one wall in the other compartment, a second retractable spindle mounted coaxially of said second plug on the said second wall, frictional engaging means on the periphery of said second spindle, a knob mounted on the outer end of said second spindle exteriorly of said case for manually driving said second spindle, means for limiting axial displacement of said second spindle, a pad mounted on the exterior surface of the bottom of said case, and means forming a pair of slots in the enclosed case adjacent opposite edges of the bottom portion of said case, said case being in the form of a frame, wherein said opposite walls are end walls, the sides of said frame being open, said cover having a top and depending side portions, the opposite ends of said cover overlying the top and side edges of said end walls, the side portions of said cover substantially closing said open sides of said frame, means adjacent said edges of said end walls to maintain said cover in fixed closed position on said end walls, the lower edges of said side portions of said cover being disposed parallel to and spaced a short distance from the adjacent side edges of said bottom portion of said frame, said spaces between said side edges of said bottom portion and said lower edges of said cover forming said pair of slots.

2. An eraser structure as defined in claim 1, including means to fasten said cover to said partition, said cover being disposed closely adjacent the top edge of said partition, and a plurality of substantially parallel grooves in the exterior surface of the side portions of said cover, to facilitate gripping of said eraser structure with the fingers.

3. An eraser which comprises a frame having a bottom portion and a pair of opposite end walls, the sides of said frame being open, a solid partition extending across the interior of said case and connected at opposite ends to said end walls, and connected along its lower edge to said bottom portion, the top of said partition extending substantially to the top of said end walls, a cover positioned over said frame and closing said frame, said cover having a top portion and depending side portions, the opposite ends of said cover overlying the top and side edges of said end walls, the side portions of said cover substantially closing said open sides of said frame, a first plate connected to the exterior of one of said end walls, the edge of said plate forming an outer lip adjacent the edges of said one end wall, a second plate connected to the exterior of the second end wall, the edge of said second plate forming an outer lip adjacent the edges of said second end wall, the ends of said cover being disposed in fixed position against said lips, a screw fastener between said cover and said partition for fastening said cover to said partition, a plurality of substantially parallel grooves in the exterior surface of the side portions of said cover, to facilitate gripping of said eraser structure with the fingers, the lower edges of said side portions of said cover being disposed parallel to and spaced a short distance from the adjacent side edges of said bottom portion of said frame, said spaces between said side edges of said bottom portion and said lower edges of said cover forming a pair of slots, said partition with said cover on said frame forming a substantially closed housing having a pair of separate compartments therein, a first fixed cylindrical plug mounted on one of said end walls in one of said compartments, a first retractable spindle mounted coaxially of said first plug on the second end wall of said frame in said one compartment, a second fixed cylindrical plug mounted on said one end wall in the other compartment, a second retractable spindle mounted coaxially of said second plug on said second end wall, grippers mounted peripherally around the inner portion of said second spindle, said first retractable spindle being mounted for axial displacement in a first pair of aligned bores in said second wall and said second plate, said second retractable spindle being mounted for axial displacement in a second pair of aligned bores in said second wall and said second plate, means for limiting axial displacement of said first spindle, means for limiting axial displacement of said second spindle, a first hollow core mounted at one end over the inner portion of said first spindle and at its opposite end over said first plug, a second hollow core mounted at one end over the inner portion of said second spindle and at its opposite end over said second plug, a roll of erasing material wound around said first core, a web of said material extending through one of said slots and exteriorly across said pad and through said other slot, the end of said erasing material being connected to said second hollow core.

4. An eraser which comprises a frame having a bottom portion and a pair of opposite end walls, the sides of said frame being open, a solid partition extending across the interior of said case and connected at opposite ends to said end walls, and connected along its lower edge to said bottom portion, the top of said partition extending substantially to the top of said end walls, a cover positioned over said frame and closing said frame, said cover having a top portion and depending side portions, the opposite ends of said cover overlying the top and side edges of said end walls, the side portions of said cover substantially closing said open sides of said frame, a first plate connected to the exterior of one of said end walls, the edge of said plate forming an outer lip adjacent the edges of said one end wall, a second plate connected to the exterior of the second end wall, the edge of said second plate forming an outer lip adjacent the edges of said second end wall, the ends of said cover being disposed in fixed position against said lips, a screw fastener between said cover and said partition for fastening said cover to said partition, a plurality of substantially parallel grooves in the exterior surface of the side portions of said cover, to facilitate gripping of said eraser structure with the fingers, the lower edges of said side portions of said cover being disposed parallel to and spaced a short distance from the adjacent side edges of said bottom portion of said frame, said spaces between said side edges of said bottom portion and said lower edges of said cover forming a pair of slots, said partition with said cover on said frame forming a substantially closed housing having a pair of separate compartments therein, a first fixed cylindrical plug mounted on one of said end walls in one of said compartments, a first retractable spindle mounted coaxially of said first plug on the second end wall of said frame in said one compartment, a second fixed cylindrical plug mounted on said one end wall in the other compartment, a second retractable spindle mounted coaxially of said second plug on said second end wall, grippers mounted peripherally around the inner portion of said second spindle, said first retractable spindle being mounted for axial displacement in a first pair of aligned bores in said second wall and said second plate, said second retractable spindle being mounted for axial displacement in a second pair of aligned bores in said second wall and said second plate, a pair of axially spaced

peripheral grooves in said first retractable spindle intermediate the ends thereof, a first recess in said one end wall, a first U-shaped spring mounted in self retaining position in said first recess, a leg of said spring being bent inwardly and received selectively in frictional engagement in one of said first and second grooves, and a pair of axially spaced peripheral grooves in said second retractable spindle intermediate the ends thereof, a second recess in said second end wall, a second U-shaped spring mounted in self retaining position in said second recess, a leg of said second U-shaped spring received selectively in frictional engagement in said last-mentioned first and second grooves, a first hollow core mounted at one end over the inner portion of said first spindle and at its opposite end over said first plug, a second hollow core mounted at one end over the inner portion of said second spindle and at its opposite end over said second plug, a roll of erasing

material wound around said first core, a web of said material extending through one of said slots and exteriorly across said pad and through said other slot, the end of said erasing material being connected to said second hollow core.

References Cited by the Examiner

UNITED STATES PATENTS

1,346,479	7/20	Bell.	
2,657,487	11/53	Sprung	40—86
2,853,817	9/58	Palm	40—86
2,880,442	4/59	Shelby	15—231

FOREIGN PATENTS

667,421	6/29	France.

CHARLES A. WILLMUTH, *Primary Examiner.*