Aug. 17, 1965 E. SUTER 3,200,774

DRAFTING APPLIANCE

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Fig.1

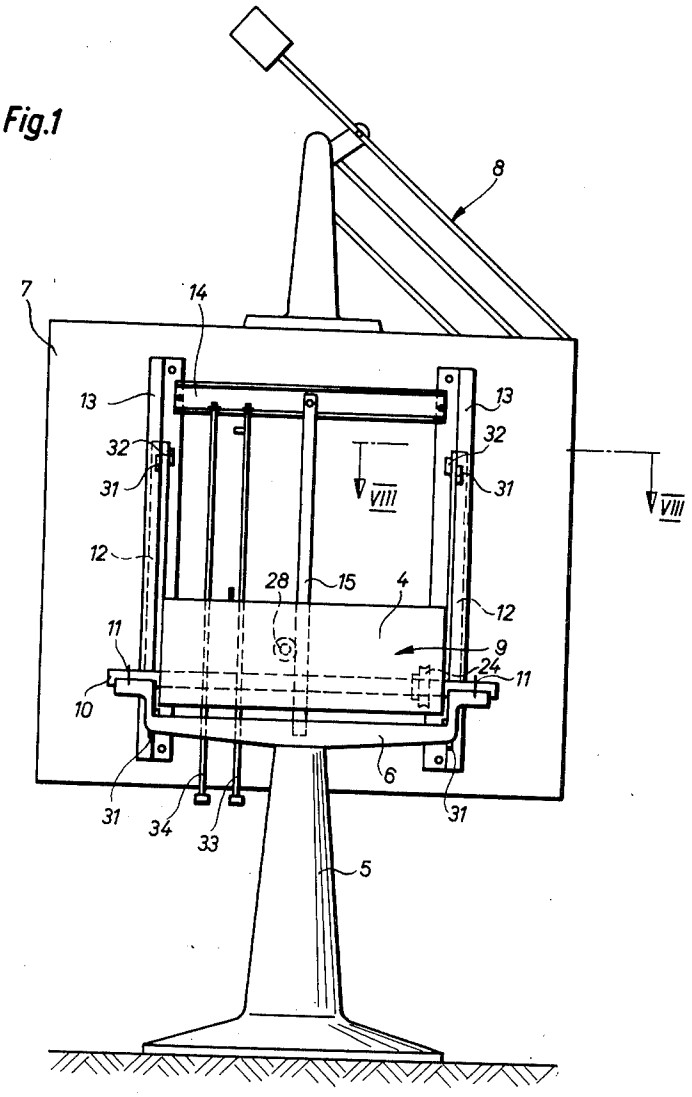
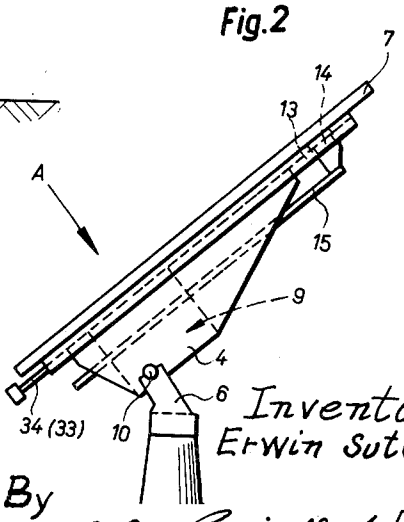


Fig.2



Inventor
Erwin Suter

By
Watson Cole, Grindle & Watson
Attys.

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Fig.3

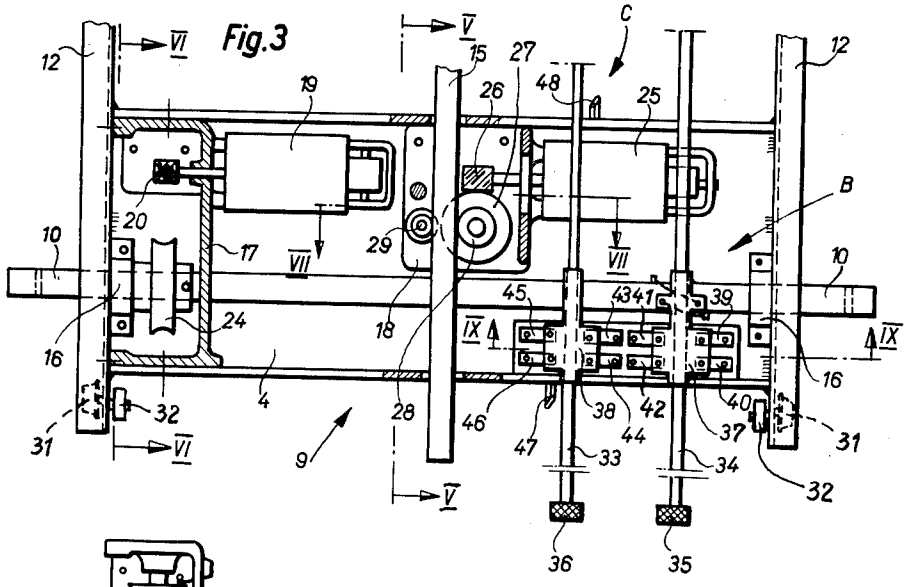


Fig.4

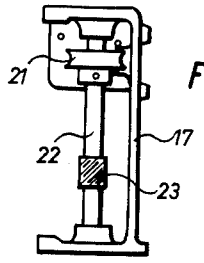


Fig.5

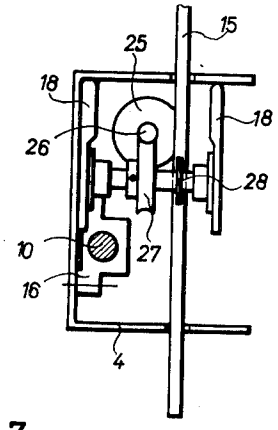


Fig.6

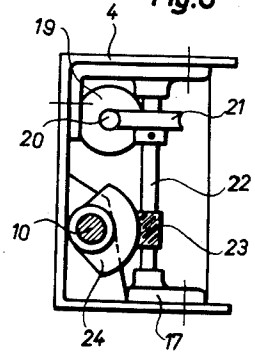
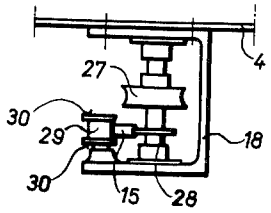


Fig.7



Inventor
Erwin Suter

By
Watson, Cole, Grindle & Watson
Atty.

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Fig.8

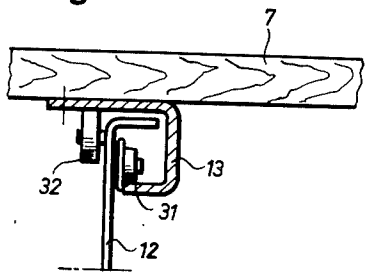


Fig.9

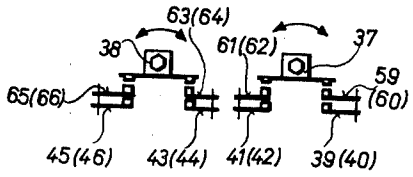
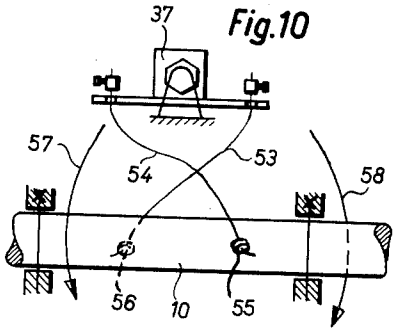


Fig.10



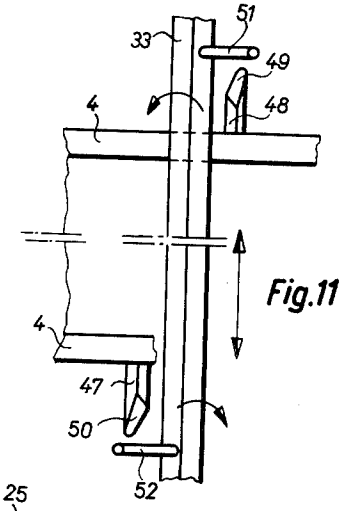
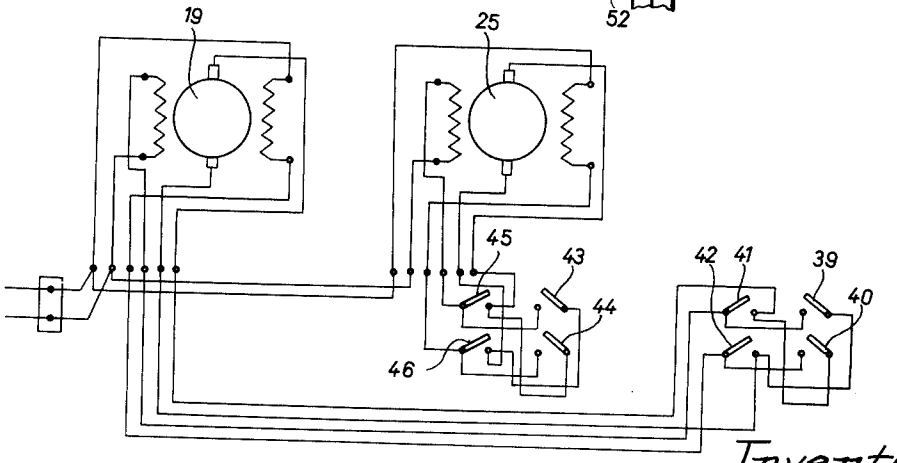


Fig.11

Fig.12



Inventor
Erwin Suter

By
Watson, Cole, Grindle & Watson
Attys.

United States Patent Office 3,200,774 Patented Aug. 17, 1965

3,200,744

DRAFTING APPLIANCE

Erwin Suter, Kolliken, Aargau, Switzerland

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Claims priority, application Switzerland, Feb. 19, 1962, 2,012/62
2 Claims. (Cl. 108—7)

This invention relates to a drafting table appliance with a device for altering the position of a drawing board relative to its stationary support.

The object underlying the invention is to provide easy and quick readjustment of the drawing board, that is inclining and lifting or lowering. Readjustment shall take place without requiring any appreciable effort, and the means necessary for readjustment shall take up a small space and be conveniently adapted in appearance to a drafting appliance which always essentially consists of a base, a drawing board and a drafting machine, such as a parallelogram guide, for example.

The drafting appliance is characterized in that the device, comprises at least one motor and two motor-driven shafts, surrounded by a casing, secondary drives serving for inclining and displacing the drawing board. The casing has attached thereto guide rails for the motor-driven displacement of the drawing board, and the motor-driven casing may be swivelled about a stationary support in order to incline or tilt the drawing board.

Further features of the invention will appear from the following description and claims, taken in conjunction with the accompanying drawing, wherein there is shown, purely by way of example, one preferred form of embodiment.

In said drawing:

FIG. 1 is a rear view in elevation of the drafting board appliance;

FIG. 2 is a side view in elevation of the drafting appliance according to FIG. 1;

FIG. 3 is a plan view of the device partly in section for inclining, lifting or lowering the drawing board, as viewed in the direction of the arrow A of FIG. 2;

FIG. 4 is a detail view of the inclining mechanism of the device according to FIG. 3;

FIG. 5 is a side view of the lifting mechanism, in section taken on the line V—V of FIG. 3 in the direction of the arrows;

FIG. 6 is a side view partly in section of the lifting mechanism taken on line VI—VI of FIG. 3 in the direction of the arrows;

FIG. 7 is a top view of the lifting mechanism, partly in section taken on the line VII—VII of FIG. 3 in the direction of the arrows;

FIG. 8 is a top view partly in section of the guide for the drawing board with respect to the device, taken on the line VIII—VIII of FIG. 1 in the direction of the arrows;

FIG. 9 is a cross section showing diagrammatically the switching means for the electric motors, taken on the line IX—IX of FIG. 3 in the direction of the arrows;

FIG. 10 is a detail view of the part B according to FIG. 3 for limiting the inclination of the drawing board;

FIG. 11 is a detail view of the part C according to FIG. 3 for limiting the displacement of the drawing board; and

FIG. 12 is an electric wiring diagram with the switching means according to FIG. 9 for the electric motor according to FIG. 3.

Referring now particularly to FIGS. 1 and 2, the fixed support of the drafting appliance is a pedestal or concrete stand 5. Stand 5 has a yoke 6 rotatably mounted thereon so that a drawing board 7 with its drafting machine 8 can be rotated about a vertical axis which is the

longitudinal axis of stand 5. The device 9, FIG. 3, for inclining, lifting or lowering the drawing board 7 is secured with its shaft 10 to the yoke 6 by means of pins 11 (FIG. 1). The device 9 includes a box-like casing 4 with two angle-iron rails 12 (FIGS. 1 and 3). For displacing and guiding the drawing board 7 with respect to the casing 4 of the device 9, channeled rails 13 are mounted on the back of the drawing board and these two rails 13 are interconnected by a channeled rail 14. Rail 14 has also hinged thereto the top end of a rod or rack 15 which protrudes through the casing 4 of device 9 (FIG. 2).

Rod 15 is motor-driven into and out of the casing 4 of device 9 in a manner which will be explained, and the casing is turned with respect to its shaft also in a manner to be explained. It is evident that by these two motor-driven drives, on the one hand the drawing board 7 is raised and lowered by means of rack 15, rails 14 and 13 and, on the other hand, the drawing board 7 is inclined by means of the rotatable casing 4 and the rails 12 which are guided in the rails 13. Thus the drawing board is displaced along the rails 12 and 13 and inclined by means of the casing 4 pivotable about shaft 10.

Further, the means for these two motor drives shall be explained with reference to FIGS. 3–7.

The rails 12 are welded to the casing 4. The shaft 10 passes through the casing 4. The bearings 16 of the shaft 10 are secured on casing 4. Moreover, within the casing 4 there is secured a bracket 17 for the inclining or tilting mechanism and a bracket 18 for the lifting mechanism of the drafting appliance. Bracket 17 is also bolt or screw connected on rail 12 and has secured thereon an electric motor 19. The pinion of motor 19 drives a wormwheel 20 meshing with a wormwheel 21 (FIGS. 3 and 4) (for the sake of clarity of FIG. 4 has been taken out of FIG. 3 and shown separately). The wormwheel 21 is mounted on a shaft 22 whose wormwheel 23 drives a worm segment 24 (FIGS. 3, 4 and 6) fixed on shaft 10.

It can be seen that, when motor 19 is running, casing 4 of device 9 together with rails 12 is pivoted about the shaft 10. The limitation of the pivot motion will be explained.

The lifting mechanism of the drafting appliance supported by bracket 18 includes an electric motor 25 which, in the example, is similar to electric motor 19. The pinion 26 of motor 25 drives a wormwheel 27 and seated on the same shaft as the wormwheel 27 is a toothed wheel 28 which meshes with a rack 15 (FIGS. 3, 5 and 7). Rack 15 is provided between this toothed wheel 28 and a roller 29 which, with its collar 30, guides the rack 15 and presses the same against the toothed wheel 28.

It will be apparent that, when the motor 25 is running, the rack 15 is raised and lowered together with the rails 14, 13 and drawing board 7. The limitation of the lifting and lowering movements will be explained.

As to their directions of rotation, the electric motors 19 and 25 are reversible, for inclining and displacing the drawing board 7 each in two opposite directions.

FIG. 8 illustrates the guide for the rails 12 and 13. Casing 4 with its rails 12 is guided in the channeled rails 13. For this, the two ends of rail 12 (FIG. 1) each carry two of said rollers 31 and 32. Roller 31 lies on the inside of one free leg, and roller 32 likewise on the inside of the other free leg of a profiled rail 13 (FIG. 8).

Two shift bars 33, 34 axially immovable, but slightly rotatable, are mounted on rail 14. These shift bars serve for switching the electric motors 19, 25 on and off in either direction of rotation. Motor 19 is operated by actuating the shift bar 34, and motor 25 by the shift bar 33 by means of handles 35, 36. The shift bars 33 and 34 are of hexagonal cross-section and slightly rotatable with

a rail 37, 38. Rails 37, 38 are fixed to the casing 4; but they can, however, be swiveled somewhat in either direction about their longitudinal axis, which is also the longitudinal axis of the shift bars 33, 34. During this swiveling movement the rails 37, 38 can actuate contacts 39–46 (FIGS. 3, 9 and 12). If the shift bar 33 is turned clockwise (FIG. 3) the contacts 43, 44 are actuated and the drawing board 7 is lowered (FIG. 3). If the shift bar 33 is turned counterclockwise (FIG. 3) the contacts 45, 46 are actuated and the drawing board 7 is raised. If the shift bar 34 is turned clockwise (FIG. 3) the contacts 39, 40 are actuated, and the drawing board inclines to the rear, that is the drawing board may be brought into a horizontal position. If the shift bar 34 is turned counterclockwise, the contacts 41, 42 are actuated, and the drawing board inclines forward, that is the board may be brought into a vertical position.

The limiting of the inclining movement as well as of the lifting and lowering movements is as follows: Arranged on casing 4 are two shift fingers 47, 48 (FIGS. 3 and 11). These shift fingers have inclined faces 49, 50. Provided on shift bar 33 are two dogs 51, 52. If now the drawing board with shift bar 33 is displaced upwards, in the topmost position of the drawing board the dog 52 runs onto face 50 of shift finger 47 and causes the shift bar to swivel clockwise (FIGS. 3 and 11). The shift bar 33 is swiveled so far that the contacts 43, 44 are now actuated, so that motor 25 is reversed at once. If the drawing board 7 moves downward, in the lowermost position the dog 51 runs onto face 49 of shift finger 48, and the shift bar is turned counterclockwise (FIGS. 3 and 11) so that the contacts 45, 46 are then actuated and the electric motor 25 likewise is reversed at once.

The limiting of the rotary movement of the casing with respect to shaft 10 is effected by cables 53, 54 (FIG. 10) which are fixed on the one hand to shaft 10 and on the other hand to the bar 37 actuating in contacts 39–42. The fixing points 55, 56 on shaft 10 lie opposite each other.

As mentioned hereinbefore, the contacts 41, 42 (FIG. 12) are operated when the shift bar 34 is turned counterclockwise, and the drawing board 7 inclines forward. This means that the bar 37 with the shift bar 34 turns about the stationary shaft 10 in the direction of the arrow 57, FIG. 10. Thereby, the cable 53 is wound somewhat around the shaft 10 and the bar 37 is turned clockwise (FIG. 10) so that contacts 39, 40 are now actuated by the bar 37, and the electric motor 19 is reversed. If on the other hand the shift bar 34 has been turned clockwise by hand (FIG. 3) the contacts 39, 40 are actuated, and the drawing board inclines to the rear, that is also the bar 37 fixed to casing 4 inclines rearward in the direction of the arrow 58, until the cable 54 is somewhat wound on shaft 10 and turns the bar 37 counterclockwise. The bar 37 now actuates the contacts, and the electric motor 19 is reversed.

Because of the leaf springs 59–66, the contacts 39–46 have to be operated against spring force (FIG. 9).

Alternatively, within the scope of the invention, it may be possible to provide only one motor for inclining and displacing the drawing board. Then, with one of the shift bars (such as 33, 34) a gear could be changed over so that, by a reversible motor alone, four directions of movement could be achieved, i.e. displacing and inclining of the drawing board each in two directions.

Instead fo electric motors, also at least one hydraulic or pneumatic motor could be provided.

Obviously, the shaft 10 of the device 9 could also be mounted on a fixed support other than stand 5. Thus the shaft may with their ends be fixed on a table or desk. It is also possible to have the ends of shaft 10 inserted in a wall.

What I claim is:

1. Drafting appliance comprising a pedestal support, a yoke rotatably mounted on an upper end of the support, a shaft secured on the yoke, a drawing board having a pair of rails secured on one side of the board in spaced relation, a channel rail interconnecting one of the ends of the said pair of rails, a casing having two rails connected thereto with the casing provided at the approximate other end of the first-mentioned rails and slidable therein by means of the two rails, a rack connected at one end to the channel rail and the other end extending through the casing, a pair of motors mounted in the casing each with connecting means, one to the rack and the other to the shaft for the yoke, and a pair of control means projecting from the casing and each manually operable, one control means to electrically energize one motor and connected to operate the rack to raise or lower the board relative to the support, the other control means to electrically energize the other motor connected to tilt the board in different inclined positions, the pair of control means each including a shift bar projecting from the casing and having contact switches electrically connected to the respective motor to control the latter.

2. Drafting appliance according to claim 1, in which means are provided connected to the casing and the shaft to limit the inclining movement of the board and the raising and lowering of the board.

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FRANK B. SHERRY, *Primary Examiner.*