Aug. 8, 1933. F. H. GOODELL ET AL 1,921,744

SHEET HANDLING MECHANISM

Filed Oct. 30, 1930 5 Sheets-Sheet 1

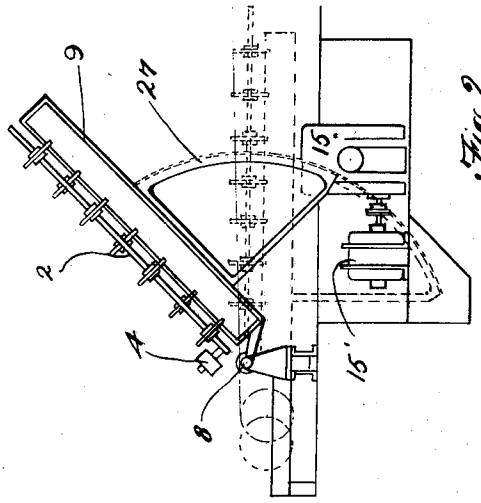


Fig. 2

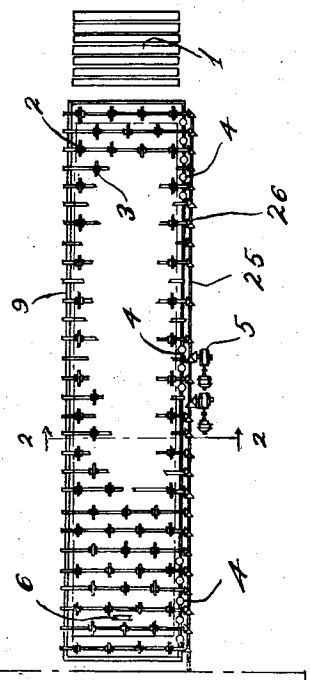
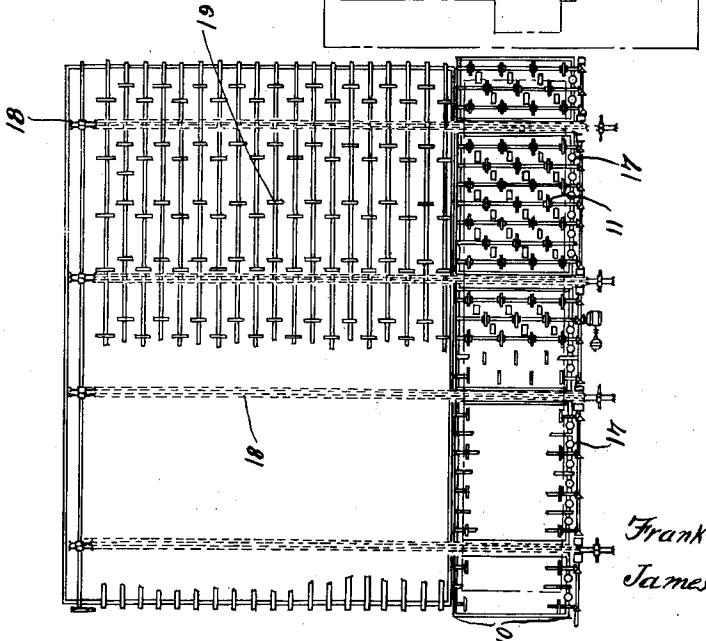


Fig. 1



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SHEET HANDLING MECHANISM

Filed Oct. 30, 1930 5 Sheets-Sheet 2

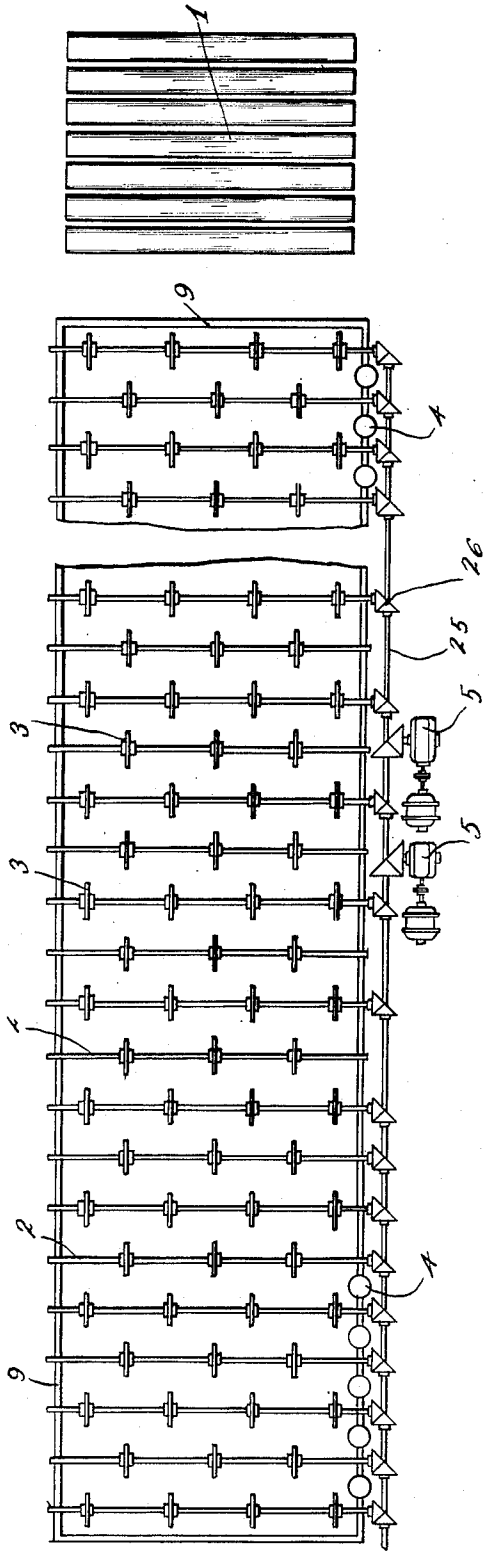


Fig. 4

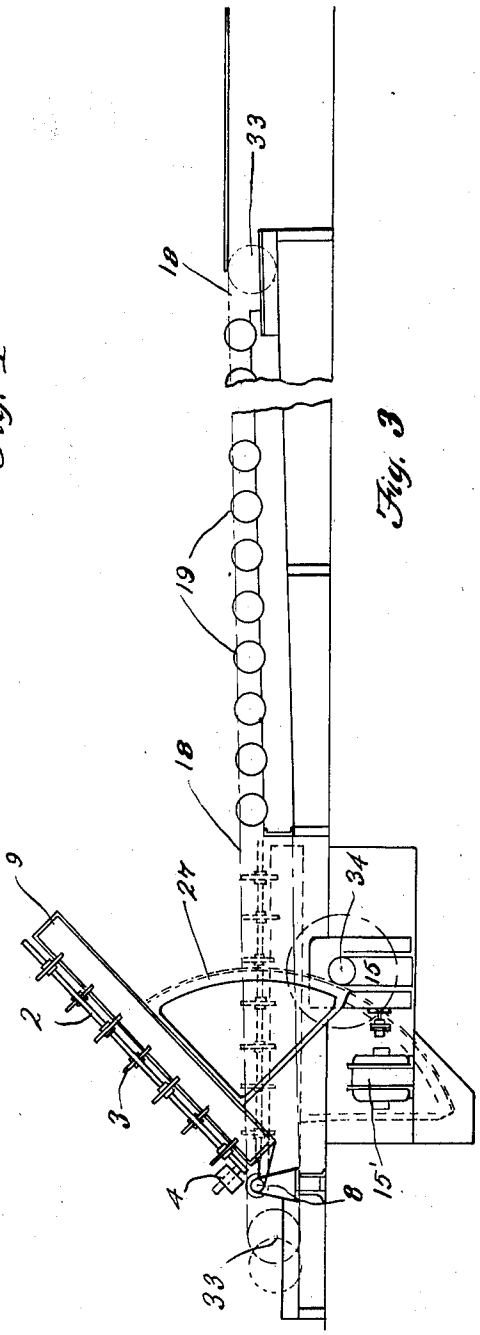


Fig. 3

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SHEET HANDLING MECHANISM

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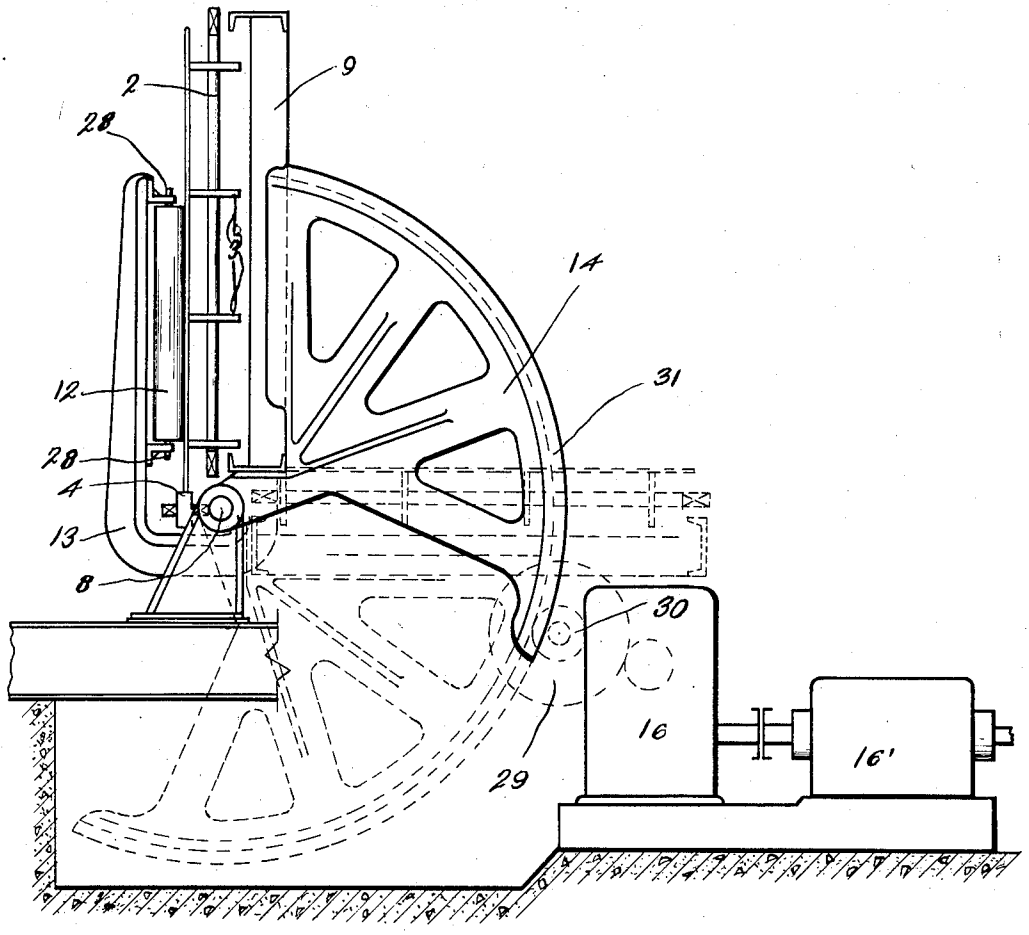


FIG. 5

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SHEET HANDLING MECHANISM

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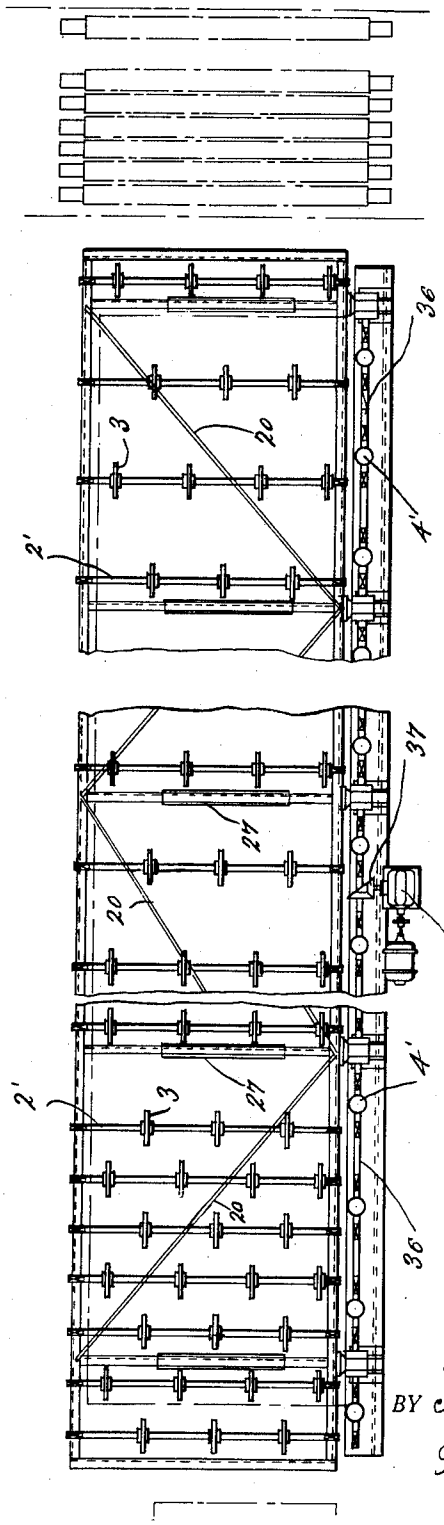


Fig. 6

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SHEET HANDLING MECHANISM

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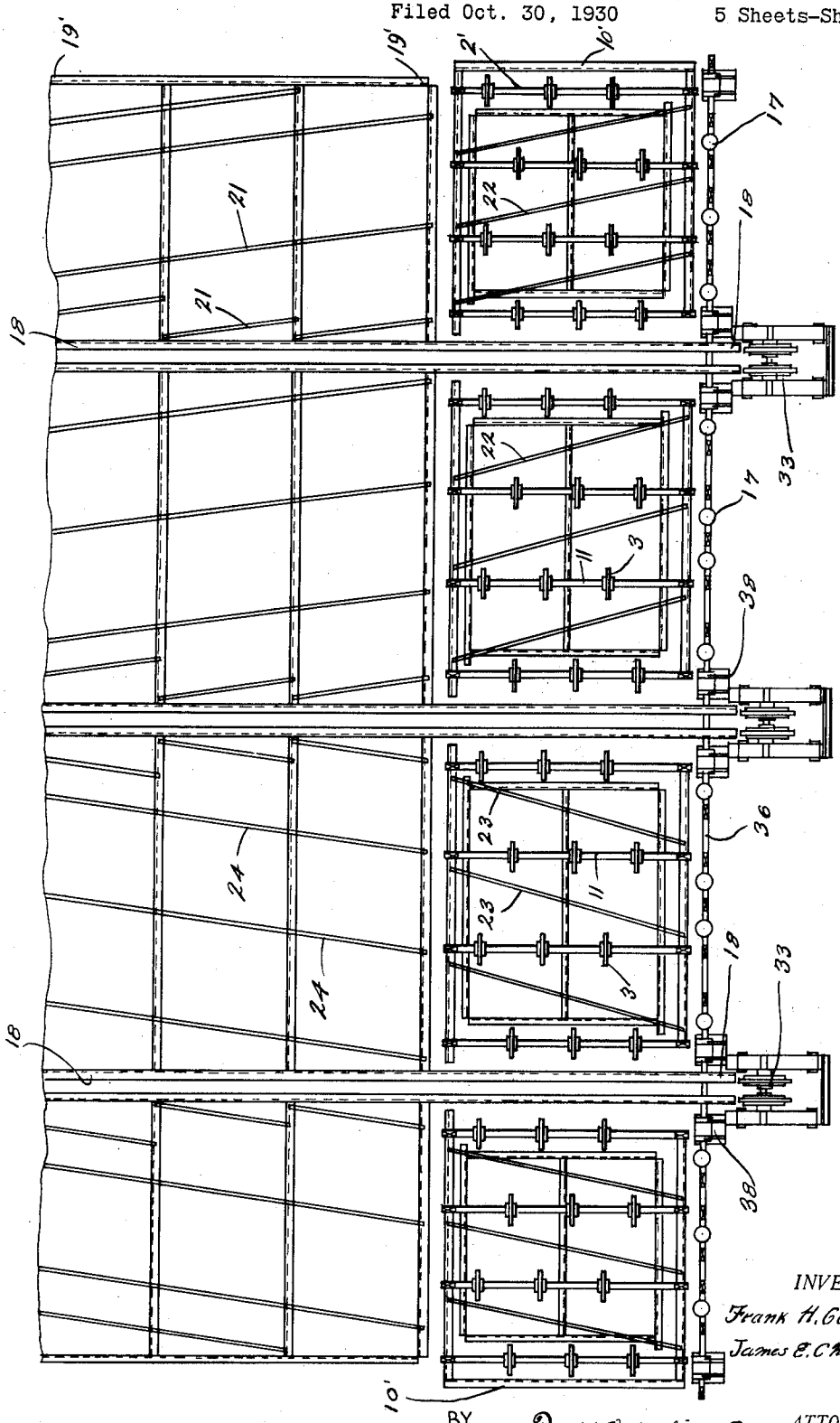


Fig. 1

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Patented Aug. 8, 1933 1,921,744

UNITED STATES PATENT OFFICE

1,921,744

SHEET HANDLING MECHANISM

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Application October 30, 1930. Serial No. 492,246

17 Claims. (Cl. 51—8)

The present invention relates to a mechanism for handling material in the form of sheets, that is, forms which have practically only two dimensions, length and width, but no thickness. More particularly our invention is a mechanism for tilting material in the form of flat sheets from a horizontal position to a desired angle in order to subject the surfaces to various treatments such as spraying, enameling, sand or shot blasting, and then tilting back to the horizontal.

The general object of our invention is to facilitate the handling of sheet material so as to substantially eliminate any manual operations and to provide a practically continuous, automatic means of manufacture. It is found that by placing a sheet at an angle from the horizontal it is possible to treat one or both surfaces, especially in shot blasting practice. Provision has also been made in the construction of the mechanism to incline the sheet at any other desired angle from between the horizontal and vertical positions so as to accommodate any treatment which might be necessary.

To the accomplishment of the foregoing and related ends, said invention, then, consists of the means hereinafter fully described and particularly pointed out in the claims, the annexed drawings and the following description setting forth in detail certain mechanism embodying the invention, such disclosed means constituting, however, but one of various mechanical forms in which the principle of the invention may be used.

In said annexed drawings:—

Fig. 1 is a plan view of the general arrangement of the tilting tables, treating mechanism and lateral receiving tables; Fig. 2 is an elevation of one of the tilting tables showing the horizontal and tilting positions; Fig. 3 is an elevation of the tilting table showing its arrangement in position with the lateral receiving bed; Fig. 4 is a detail of a tilting table showing the means of sheet conveying; Fig. 5 is an elevation of a varied form of construction of the tilting mechanism; Fig. 6 is a plan view of the tilting table showing another form of conveying construction; and Fig. 7 is a plan view of the tilting table arranged in conjunction with the lateral receiving bed.

For the purpose of the present description, the mechanism designed to handle sheet steel for shot blasting treatment will be explained. The sheets from the sheet mill are fed from the live rolls 1, Fig. 1, or other means, onto the face of the tiltable table in horizontal position and are conveyed the length thereof by a conveying means which may consist of transverse horizontal shafts 2 with roller elements 3 placed thereon. These shafts may each be power driven by means of bevel gears 26, motivated by shafts 25 which are in turn driven by a mechanism 5, or they may be intermittently spaced with idler shafts 2', as shown in Fig. 4. When the moving sheet contacts with the limit switch 6, the longitudinal conveying means are automatically stopped and a motivating means 15 is set into operation, causing the gears 34 to rotate the gear segment 27, and to arcuately incline the table 9 about the stanchion and pivot 8, until the table frame 9 is elevated to the predetermined desired angle. It may be noted at this point that if it is desirous of tilting these sheets to a complete vertical position, a structure as shown in Fig. 5 may be employed which is substantially the same as the structure shown in Fig. 2, except that the arc of gear segment 14 is increased, and retaining idler rolls 12, mounted on the arm 13 are placed in such a position opposite the face of the conveying rolls 2 that the sheets will be substantially retained on the face of the tilting table. The inclining mechanism, composed of driving means 16 and 16' and gears 29 and 30, has been placed in a slightly different position so that it may be more readily accessible for purposes of service and inspection. After the table has been raised to the desired angle, rollers 4 which are placed along one side of the table, and whose axes are normal to the plane thereof, are automatically set in motion by a driving means 5' connected to the longitudinal shafts 36 by means of bevel gears 37, Fig. 6, delivering the sheets into the treating mechanism 7. The rolls 4 may also be idler rolls while the conveying motion is supplied by the transverse power driven shafts 2 and rollers 3. After the sheet has entirely entered the treating mechanism, the table is lowered to receive the next sheet. The sheets after emerging from the treating mechanism in inclined position are received by a similar tilting table 10 which is also supplied with conveying means, such as transverse shafts 11, rollers 3 and vertical rollers 17. The latter rollers may be driven by means of longitudinal shafts 36 motivated by a prime mover 38, Fig. 7. When the entire sheet has passed onto the receiving table 10, it is then automatically lowered into a horizontal position or approximate horizontal position as shown by the dotted lines in Fig. 3. On reaching the horizontal position or approximate horizontal position, the sheets may be conveyed forward in a longitudinal direction,

or endless chains 18, traveling around the power-driven pulleys 33, said chains having dogs mounted thereon at specified intervals, are set in motion with the result that the sheets are moved in a lateral transverse direction onto the bed 19. This lateral receiving bed may be constructed with shafts and rollers, as illustrated in Fig. 1, or it may have the construction shown in Fig. 7 where supporting bars 21 and 24 are placed across the face of the table 19' at substantially an acute angle to the direction of motion of the sheets received thereon. The result of the angular position of the supporting bars is that a wiping action is produced on the face of the sheets so that any small foreign particles are removed. These same supporting bars may be incorporated into the construction of the tiltable table 10' as represented by bars 22 and 23 in Fig. 7.

Other modes of applying the principle of our invention may be employed instead of the one explained, change being made as regards the mechanism herein disclosed, provided the means stated by any of the following claims or the equivalent of such stated means be employed.

We therefore particularly point out and distinctly claim as our invention.

1. In a sheet handling mechanism, the combination of a tiltable table comprising a frame, power driven shafts rotatably mounted on said frame and extending transversely thereof, a plurality of rollers rotatably mounted on one side of such frame with the axes thereof substantially at right angles to the axes of said shafts, means for driving said shafts, and means for effecting arcuate movement of said table.

2. In a sheet handling mechanism, the combination of a tiltable table comprising a frame, rotatable rollers mounted on said frame transversely thereof, rotatable rolls mounted on one side of said frame with the axes thereof substantially at right angles to the axes of said rollers, means for arcuately moving said table to the desired inclination, and means automatically driving said rollers upon attainment of the proper inclination by said table.

3. In a sheet handling mechanism, the combination of a tiltable table comprising a frame, rotatable shafts mounted on said frame and extending transversely thereof, sheet retaining rolls oppositely disposed and axially parallel to such transverse shafts, a plurality of rotatable rolls mounted along one side of said frame with the axes thereof substantially at right angles to the axes of said shafts, means for effecting arcuate movement of said table, and means for driving said rolls and shafts.

4. In a sheet handling mechanism, the combination with a tiltable table adapted to receive sheets in a tilted position and return the same to a horizontal position, and movable means extending transversely of said table adapted to move such sheets laterally therefrom upon attainment of a horizontal position by such table.

5. In a sheet handling mechanism, the combination of a tiltable table comprising a frame, a plurality of rotatable shafts mounted on said frame, a plurality of rollers mounted on one side of said frame with the axes thereof substantially at right angles to the axes of said shafts, means for effecting arcuate movement of said table, means for driving said shafts, and movable means extending transversely of said table adapted to move such sheets laterally therefrom.

6. In a sheet handling mechanism, the combination of a tiltable table comprising a frame, rotatable shafts mounted transversely of said frame, a plurality of rotatable rolls mounted on one side of said frame with the axes thereof substantially at right angles to the axes of said shafts, means for effecting arcuate movement of said table, and horizontally arranged movable means extending transversely of said table adapted to convey sheets laterally therefrom upon attainment thereby of a substantially horizontal position.

7. In a sheet handling mechanism, the combination of a tiltable table comprising a frame, rotatable shafts mounted transversely of said frame, sheet retaining rolls oppositely disposed and axially parallel to said transverse shafts, a plurality of rotatable rolls mounted on one side of said frame with the axes thereof substantially at right angles to the axes of said shafts, means for effecting arcuate movement of said table, means for driving said rolls and shafts, and horizontally arranged movable means extending transversely of said table adapted to convey sheets laterally therefrom upon attainment thereby of a substantially horizontal position.

8. In a sheet handling mechanism, the combination with means for treating such sheets when disposed at an angle with the horizontal, a tiltable table comprising a frame having transversely extending rotatable shafts mounted thereon, a plurality of rolls rotatably mounted along one side thereof, means for driving said rolls, means for effecting arcuate movement of said frame; adapted to present such sheets to such treating means, a tiltable table adapted to receive such sheets from such treating means and return the same to a horizontal position, and horizontally arranged movable means extending transversely of said last-named table adapted to move such sheets laterally therefrom when returned to a horizontal position.

9. In a sheet handling mechanism, the combination with means for treating such sheets when disposed at an angle with the horizontal, a tiltable table comprising a frame having transversely extending rotatable shafts mounted thereon with means for arcuately rotating said table from the horizontal to an angle of at least 90 degrees, means for retaining such sheets on the face of said table, a plurality of rolls rotatably mounted along one side thereof; adapted to present such sheets to such transverse means, a tiltable table adapted to receive such sheets from such treating means and return the same to a horizontal position, and horizontally arranged movable means extending transversely of said last-named table adapted to move such sheets laterally therefrom when returned to a horizontal position.

10. In a sheet handling mechanism, the combination with a tiltable table adapted to receive sheets in a tilted position and return the same to a horizontal position and means adapted to convey such sheets straight ahead in a longitudinal direction therefrom upon attainment of a horizontal position by such table.

11. In a sheet handling mechanism, the combination of a tiltable table comprising a frame, a plurality of rotatable shafts mounted on said frame, a plurality of rollers mounted on one side of said frame with the axes thereof substantially at right angles to the axes of said

shafts, means for effecting arcuate movement of said table, means for driving said shafts, and means adapted to convey such sheets straight ahead in a longitudinal direction from said table.

12. In a sheet handling mechanism, the combination of a tiltable table comprising a frame, rotatable shafts mounted transversely of said frame, a plurality of rotatable rolls mounted on one side of said frame with the axes thereof substantially at right angles to the axes of said shafts, means for effecting arcuate movement of said table, and means adapted to convey such sheets straight ahead in a longitudinal direction from said table.

13. In a sheet handling mechanism, the combination of a tiltable table comprising a frame, rotatable shafts mounted transversely of said frame, sheet retaining rolls oppositely disposed and axially parallel to said transverse shafts, a plurality of rotatable rolls mounted on one side of said frame with the axes thereof substantially at right angles to the axes of said shafts, means for effecting arcuate movement of said table, means for driving said rolls and shafts, and means adapted to convey such sheets straight ahead in a longitudinal direction from said table upon attainment thereby of a substantially horizontal position.

14. In a sheet handling mechanism, the combination with means for treating such sheets when disposed at an angle with the horizontal, a tiltable table comprising a frame having transversely extending rotatable shafts mounted thereon, a plurality of rolls rotatably mounted along one side thereof, means for driving said rolls, means for effecting arcuate movement of said frame; adapted to present such sheets to such treating means, a tiltable table adapted to receive such sheets from such treating means and return the same to a horizontal position, and means adapted to convey such sheets straight ahead in a longitudinal direction from said table.

15. In a sheet handling mechanism, the combination with means for treating such sheets when disposed at an angle with the horizontal, a tiltable table comprising a frame having transversely extending rotatable shafts mounted thereon with means for arcuately rotating said table from the horizontal to an angle of at least 90 degrees, means for retaining such sheets on the face of said table, a plurality of rolls rotatably mounted along one side thereof; adapted to present such sheets to such transverse means, a tiltable table adapted to receive such sheets from such treating means and return the same to a horizontal position, and means adapted to convey such sheets straight ahead in a longitudinal direction from said table upon attainment thereby of a substantially horizontal position.

16. In a sheet handling mechanism, the combination with means for treating such sheets when disposed at an angle with the horizonal, a tiltable table comprising a frame having transversely extending rotatable shafts mounted thereon, a plurality of rolls rotatably mounted along one side thereof, means for effecting arcuate movement of said frame; adapted to present such sheets to such treating means, driving means for said rolls upon attainment of the proper inclination of the table, a tiltable table adapted to receive such sheets from such treating means and return the same to a horizontal position, and means adapted to convey such sheets straight ahead in a longitudinal direction from said table upon attainment thereby of a substantially horizontal position.

17. In a sheet handling mechanism, the combination with means for treating such sheets when disposed at an angle with the horizontal, a tiltable table comprising a frame having transversely extending rotatable shafts mounted thereon, a plurality of rolls rotatably mounted along one side thereof, means for effecting arcuate movement of said frame; adapted to present such sheets to such treating means, driving means for said rolls upon attainment of the proper inclination of the table, a tiltable table adapted to receive such sheets from such treating means and return the same to a horizontal position, and horizontally arranged movable means extending transversely of said last named table adapted to move such sheets laterally therefrom when returned to a horizontal position.

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