June 13, 1950 G. W. BEHNKE ET AL 2,511,239

SCREEN CLOTH ANCHORING AND TENSIONING MEANS

Filed Jan. 13, 1947 3 Sheets-Sheet 1

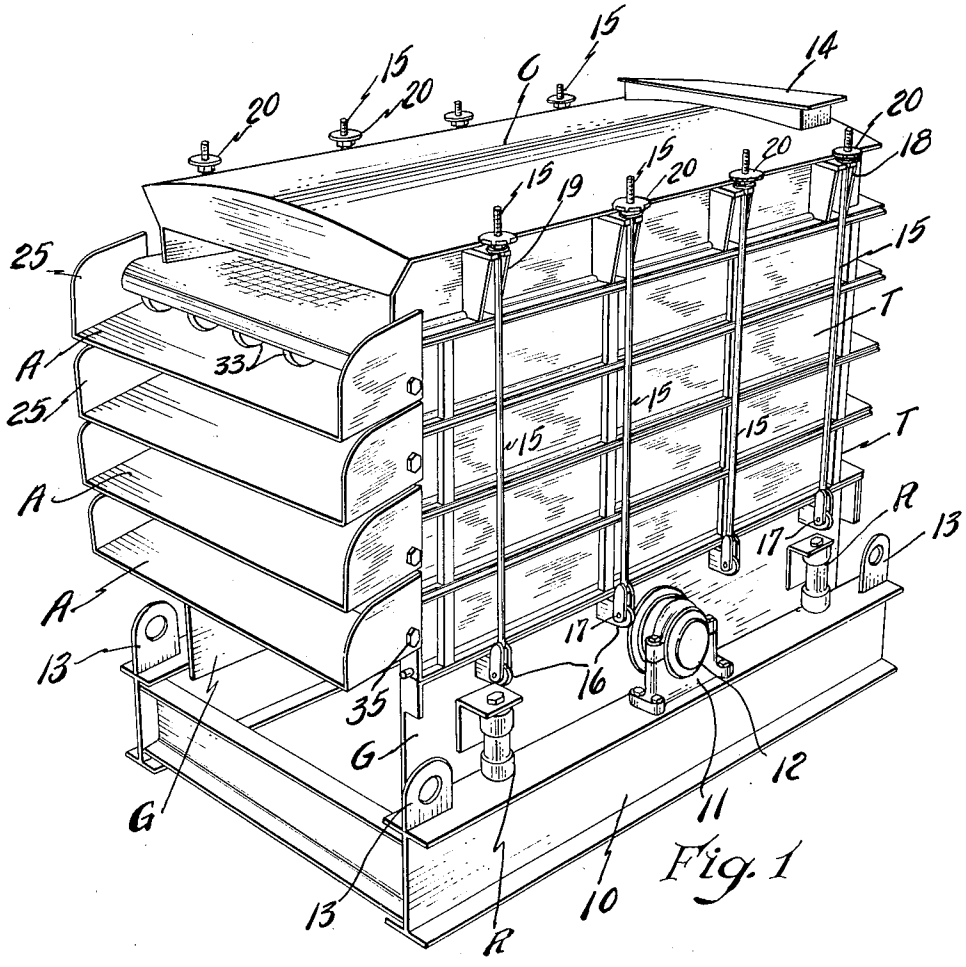


Fig. 1

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SCREEN CLOTH ANCHORING AND TENSIONING MEANS

Filed Jan. 13, 1947 3 Sheets-Sheet 2

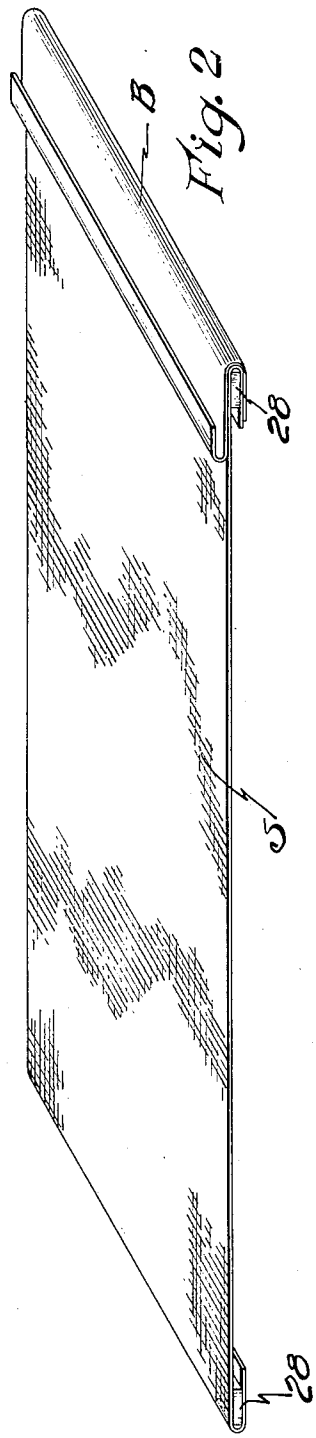


Fig. 2

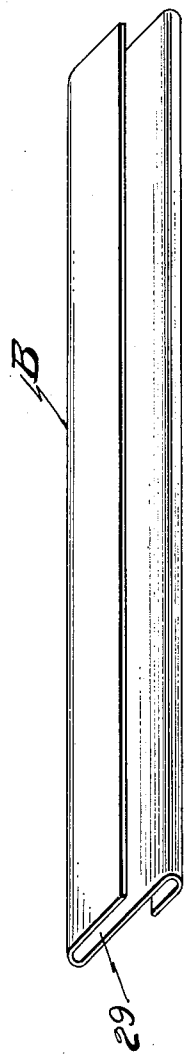


Fig. 3

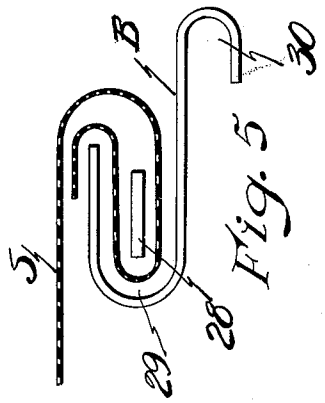


Fig. 5

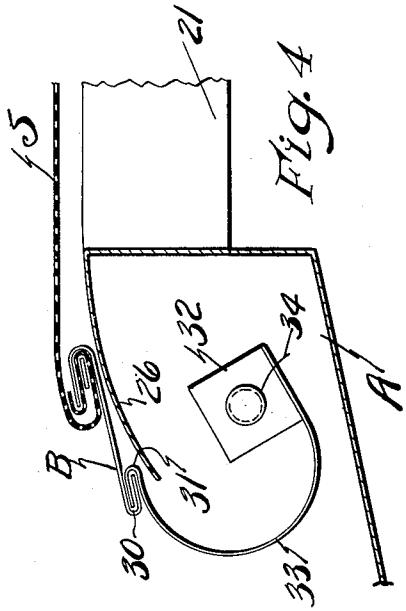


Fig. 4

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SCREEN CLOTH ANCHORING AND TENSIONING MEANS

Filed Jan. 13, 1947 3 Sheets-Sheet 3

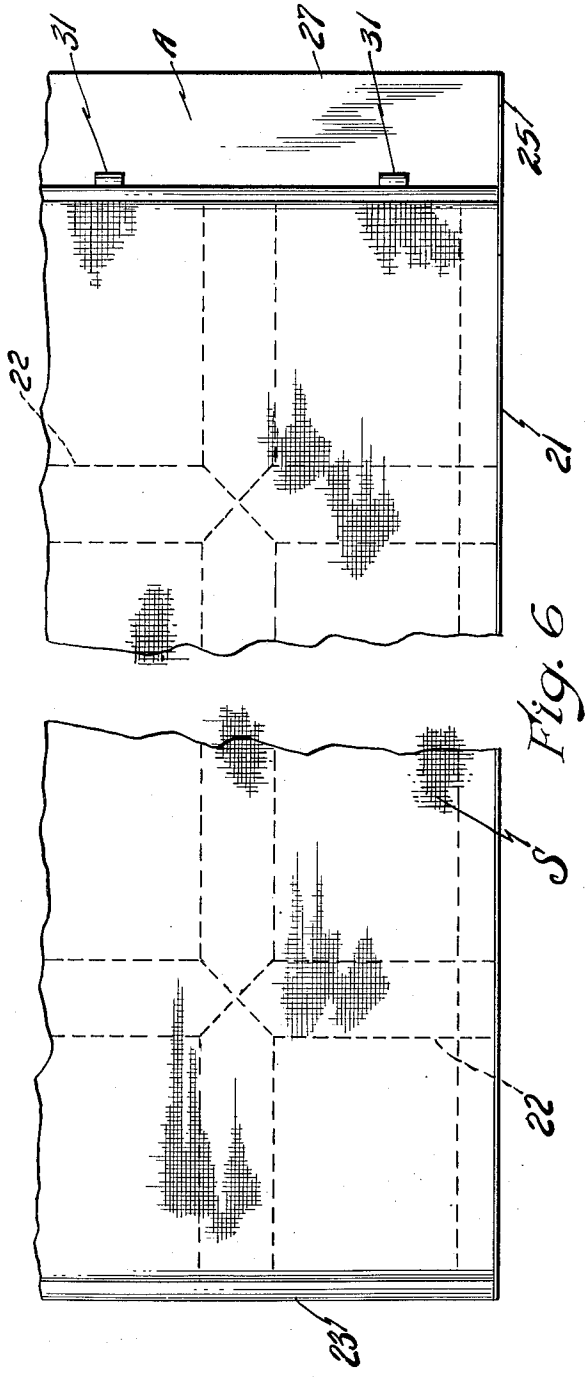


Fig. 6

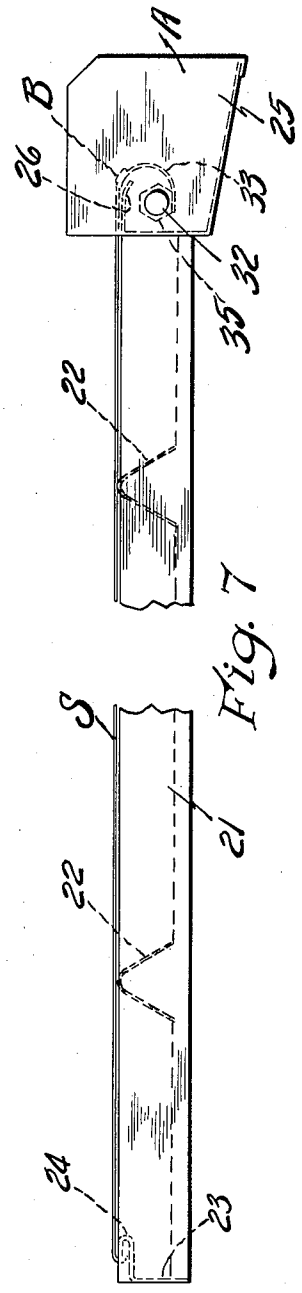


Fig. 7

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UNITED STATES PATENT OFFICE

2,511,239

SCREEN CLOTH ANCHORING AND TENSIONING MEANS

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Application January 13, 1947, Serial No. 721,686

3 Claims. (Cl. 209—403)

1

This invention relates to screen anchoring and tensioning means for screening machines, and more particularly to a screening machine for screening fine food products and similar materials.

One of the prime objects of the invention is to design means for anchoring screen cloth of very fine mesh to the screen trays or frames, and without the use of bolts, rivets, or any other securing means which would necessitate providing openings in the cloth.

Screen cloth of the nature described is capable of withstanding, for a considerable period of time, the severe stretch and strains necessary when used for screening fine materials of all kinds, but when the cloth is once ruptured by insertion of a bolt, rivet, welding, or any other means, it readily runs and tears, making replacement necessary with the resultant loss in time, materials and efficiency.

It is, therefore, one of the salient objects of the invention to provide means engageable with the end sections of each screen strip, for uniformly and evenly gripping and anchoring the screen cloth at its ends, and to also provide means for continuously and automatically tensioning the cloth.

Another object is to provide easily and quickly removable and insertable means, uniformly and evenly engageable over the entire width of the end section of each screen cloth strip for clamping a relatively large area of each section of said strip.

A further object is to provide simple, practical, and inexpensive means whereby the screen tension may be easily and quickly adjusted and held.

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 appended claims, the annexed drawings and following description setting forth, in detail, certain means and one mode of carrying out the invention, such disclosed means and mode illustrating, however, but one of various ways in which the principle of the invention may be used.

In the drawings:

Fig. 1 is an isometric view of a screening apparatus showing a plurality of screen trays arranged in superimposed relation thereon.

Fig. 2 is an enlarged, isometric view showing a strip of screen cloth with the take-up bar and lock strip in position.

Fig. 3 is an enlarged, perspective view of the front take-up bar.

Fig. 4 is an enlarged, fragmentary, side-elevational view illustrating the tray frame and spring take-up means.

Fig. 5 is a fragmentary, side-elevational, diagrammatic view showing the take-up bar and lock strip rolled over from the position shown in Fig. 2.

2

Fig. 6 is a fragmentary, plan view of one of the tray frames, and

Fig. 7 is a side-elevational view thereof with the screen cloth in position thereon.

Referring now more specifically to the drawings in which we have shown one embodiment of our invention: The numeral 10 indicates a fabricated structural frame having bearings 11 mounted thereon intermediate its length, an eccentric or gyrating shaft 12 being journaled in said bearings in the usual manner, and as fully described in Patent No. 2,311,814, granted to us under date of February 23, 1943.

This frame 10 may be mounted on a suitable foundation, or it may be suspended from overhead supports (not shown), if desired, suitable brackets 13 being provided on the corners of the frame to facilitate such suspension.

A gyratory frame G is mounted on the eccentric shaft 12 and is operable thereby, resilient corner supports R being attached to the gyratory frame and to the main frame 10 for yieldingly resisting movement thereof out of its normally balanced state, and for maintaining it in proper screening position, irrespective of load distribution and without in any manner interfering with the gyratory movement of the frame.

A plurality of individual tray members T are mounted on the gyratory frame G in superimposed relation, and a sheet metal cover C fits over the uppermost tray, said cover being formed with an intake spout 14 through which the material to be screened is fed to the machine.

Vertically disposed rods 15 are hingedly connected to brackets 16 provided on the side walls of the gyratory frame by means of bolts 17, the upper threaded end of each rod extending through a slotted opening 18 formed in the brackets 19 provided on the side walls of the cover, and hand nuts 20 are threaded on the upper threaded ends of the rods for rigidly securing the trays in assembled relation.

Each tray frame includes side bars 21 and a plurality of transversely disposed cross bars 22 which are welded together so that the screen contacting areas are smooth and clean.

A cross bar 23 spans the front end of the frame, said bar being reversely bent to form an overhanging lip 24, the opposite end of said frame having a laterally projecting apron section A, the side walls 25 of which project above and below the main frame, and a curved lip 26 forms a part of said apron, said lip extending flush with the top of the frame, while the bottom wall forms a pan into which the material is discharged from the screen.

In the application of the screen cloth S to the

tray, it is essential that the screen cloth be cut absolutely square; it is then placed on a suitable frame, and each section is folded under as shown in Fig. 2 of the drawings, after which an elongated, smooth lock strip or bar 28 is inserted in each fold, and this fold with the lock strip in position, is then placed in the channel 29 formed in the rear take-up bar B.

The take-up bar is then rolled over onto its reverse side (see Fig. 5 of the drawings), and when tension is exerted on the strip, the screen cloth will be firmly locked in position, the cloth being wrapped around the lock strip with the free end of the cloth overlying the end of the take-up bar so that the main body of the screen is stretched thereover, and does not come in direct contact with the edge of the screen frame.

With the screen cloth bottom face up, we then insert the feed end of the lock strip and folded screen cloth into the metal channel or groove 24 provided on the front feed end of the frame; with the screen cloth in this position we lay the remaining cloth on the frame top side up, and the take-up bar B is then in position for attachment at the discharge end of the frame; we then attach the turned lip section 30 of the take-up bar to the turned ends 31 of the tensioning members.

The tensioning means comprises a transversely disposed, preferably square shaft 32 which spans the apron A and projects through the side walls 25 thereof, a plurality or upwardly curved spring members 33 being rigidly mounted thereon in spaced-apart relation, and the ends 31 of said springs being hook-shaped for easy engagement with the folded reversely bent lip section 30 of the take-up bar.

The ends of the shaft 32 are turned and threaded as at 34, these ends projecting through the side walls 25 of the apron A, and nuts 35 serve to secure the shaft in set position.

When the screen S is placed on the frame, the turned ends 31 of the springs 33 engage the turned lip 30 of the take-up bar B, and when it is desired to tension the screen, the shaft 32 is turned clockwise to bring the screen to desired tension, and it is there held until such time as it is desired to again tighten or remove the screen.

The manner of connecting the ends of the screen is of prime importance because of the nature of the cloth, as hereinbefore stated; it is capable of considerable tension and wear excepting when the strands are shifted or broken to provide bolt or rivet holes, or when stretched over sharp edges, and in our method of anchoring, such disadvantages are eliminated, all contacting corners are rounded, the strain is evenly distributed over the entire width of the cloth, and in addition, the greater the pull, the tighter the screen cloth grips the lock strip, so that the bearing on the free ends of the screen and frame is also enhanced.

The tensioning adjustment is extremely simple and easy to make, because the spring members 33 are resilient, the lock strip extends the entire width of the cloth, so there can be no blind spots or areas on the screen.

From the foregoing description, it will be obvious that we have perfected a very simple, practical, and effective screen cloth anchoring and tensioning means for screening machines and the like.

What we claim is:

1. In a screening apparatus, the combination of a frame having a transversely disposed, hook-shaped section at the front end thereof, and a transversely-disposed apron-shaped section at the rear end, said apron being formed with vertical, end and bottom walls, a transverse, horizontally disposed, downwardly curved lip formed integral with the vertical wall and in alignment with and forming an extension of the top of the frame, a screen strip spanning said frame from end-to-end, take-up bars at the opposite ends of the screen strip and formed with opposed, hook-shaped upper and lower sections, the lower section of the front take-up bar releasably interlocking with the front hook-shaped section of the frame, a lock bar loosely mounted in the upper hook-shaped section of said bar and around which one end of the screen strip is wrapped with the end of the screen overlapping the end of the upper hook-shaped section for frictionally securing the free end between said hook-shaped section and the main body of the screen strip, a similar lock bar mounted in the upper section of the rear take-up bar and around which the opposite end of the screen strip is wrapped with the end of the screen overlapping the upper end of the upper section of the rear take-up bar and securing it between said section and the main body of the screen strip when the screen is tensioned, and adjustable, yieldable means connected to the lower hook-shaped section of the rear bar for tensioning said screen strip.

2. The combination defined in claim 1 in which a transversely disposed shaft spans the end walls of the apron on the rear of the frame, flat, bowed leaf spring members connected to said shaft and to the lower section of the take-up bar, and means for rotatably adjusting said shaft to tension the screen strip.

3. The combination defined in claim 1 in which a transversely disposed, rotatably adjustable shaft is mounted in said apron and the yieldable means comprises transversely spaced leaf springs connected to the lower end of the rear take-up bar and to said shaft for tensioning said screen strip.

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