COMPRESSION APPARATUSES, SYSTEMS AND METHODS FOR SCREENING MATERIALS

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application claims the benefit of U.S. Provisional Patent Application Serial No. 63/464,982, filed May 9, 2023, the entire contents of which are hereby incorporated by reference and the priority of which is hereby claimed.

FIELD

[0002] The present disclosure relates generally to material screening. More particularly, the present disclosure relates to apparatuses and methods for compressing screening assemblies to screening machines.

BACKGROUND

[0003] Material screening includes the use of vibratory screening machines. Vibratory screening machines provide the capability to excite an installed screen such that materials placed upon the screen may be separated to a desired level. Oversized materials are separated from undersized materials. Over time, screens wear and require replacement. As such, screens are designed to be replaceable.

SUMMARY

[0003A] In one aspect, the present disclosure refers to a screen assembly for separating materials, comprising: a support member including: a flow through area surrounded by front and rear edges and first and second side edges, wherein a plurality of flow through apertures are provided in the flow through area, each flow through aperture extending through the support member from a top surface to a bottom surface of the flow through area; a first plurality of mounting apertures located on the first side edge of the support member, each of the first plurality of mounting apertures including at least one compression surface configured to receive a compression force used to secure the screen assembly to a screening machine; and a screening surface attached to the top surface of the flow through area.

BRIEF DESCRIPTION OF THE DRAWINGS

[0004] FIG. 1A shows a perspective view of a dual-trough vibratory screen machine with installed replaceable screen assemblies, in an embodiment.

[0005] FIG. 1B shows a perspective view of the dual-trough vibratory screen machine of FIG. 1A with one of the replaceable screen assemblies removed, in an embodiment.

[0006] FIG. 1C shows a side view of the vibratory screen machine of FIG 1A, in an embodiment.

[0007] FIG. 1D shows a perspective view of a single-trough vibratory screening machine with an installed replaceable screen assembly, in an embodiment.

WHAT IS CLAIMED IS:

1. A screen assembly for separating materials, comprising:

a support member including:

a flow through area surrounded by front and rear edges and first and second side edges, wherein a plurality of flow through apertures are provided in the flow through area, each flow through aperture extending through the support member from a top surface to a bottom surface of the flow through area;

a first plurality of mounting apertures located on the first side edge of the support member, each of the first plurality of mounting apertures including at least one compression surface configured to receive a compression force used to secure the screen assembly to a screening machine; and

a screening surface attached to the top surface of the flow through area.

2. The screen assembly of claim 1, wherein the at least one compression surface of each of the first plurality of mounting apertures is located inward from the first side edge.

3. The screen assembly of claim 1, wherein the at least one compression surface of each of the first plurality of mounting apertures comprises first and second compression surfaces located on opposite sides of an alignment groove, the alignment groove extending from the first and second compression surfaces inward toward a centerline of the support member.

4. The screen assembly of claim 1, wherein the support member further includes a first upwardly extending flange located on the first side edge of the support member, wherein a first plurality of access apertures are provided in the first upwardly extending flange.

5. The screen assembly of claim 4, wherein each of the first plurality of access apertures comprises an extension of a corresponding one of the first plurality of mounting apertures.

6. The screen assembly of claim 4, wherein the support member further includes a second upwardly extending flange located on the second side edge of the support member.

7. The screen assembly of claim 6, wherein the first and second upwardly extending flanges extend in a direction that is substantially perpendicular to the top surface of the flow though area.

8. The screen assembly of claim 6, wherein a second plurality of access apertures are provided in the second upwardly extending flange, the support member further comprising a second plurality of compression surfaces, each of the second plurality of compression surfaces comprising a lower edge portion of one of the second plurality of access apertures.

9. The screen assembly of claim 1, wherein the support member further comprises at least one compression surface located on the second side edge of the support member.

10. The screen assembly of claim 1, wherein a second plurality of mounting apertures are provided on the second side edge of the support member, each of the second plurality of mounting apertures including at least one compression surface configured to receive a compression force used to secure the screen assembly to a screening machine.

11. The screen assembly of claim 10, wherein the at least one compression surface of each of the first plurality of mounting apertures is located inward from the first side edge and wherein the at least one compression surface of each of the second plurality of mounting apertures is located inward from the second side edge.

12. The screen assembly of claim 10, wherein each of the first plurality of mounting apertures and the second plurality of mounting apertures further comprises an alignment slot that extends from a compression surface of the mounting aperture inward towards a centerline of the support member.

13. The screen assembly of claim 12, wherein each at least one compression surface of each of the first plurality and the second pluralities of mounting apertures comprises first and second compression surfaces located on opposite sides of the alignment slot.

14. The screen assembly of claim 1, wherein the support member is configured to preferentially flex into a concave shape in which a center of the support member is lower than the first and second side edges of the support member when compression forces having a component directed toward a centerline of the support member are applied to the first and second side edges.

15. The screen assembly of claim 9, wherein the support member further comprises an upwardly extending flange located along the second side edge.

16. The screen assembly of claim 15, wherein the at least one compression surface located on the second side edge of the support member is located on the upwardly extending flange located on the second side edge.