

July 24, 1962

W. J. PARKS

3,045,824

BASE FRAME FOR VIBRATING SCREENING APPARATUS

Filed Nov. 20, 1959

2 Sheets-Sheet 1

FIG. 1

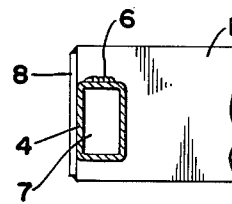
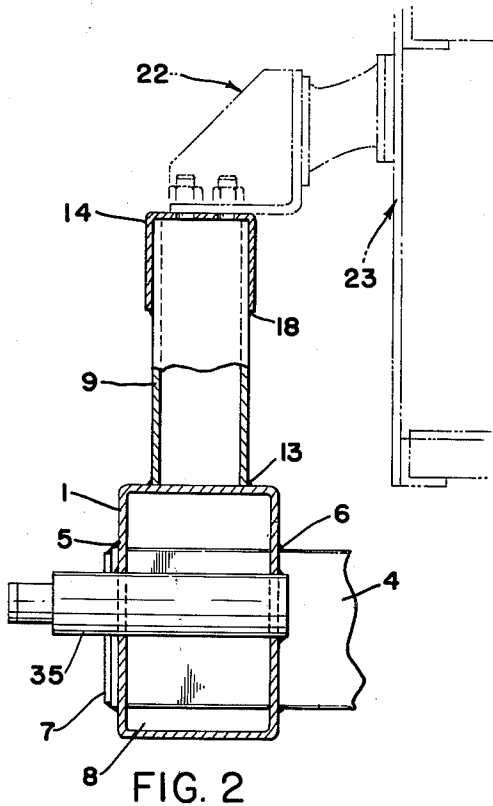
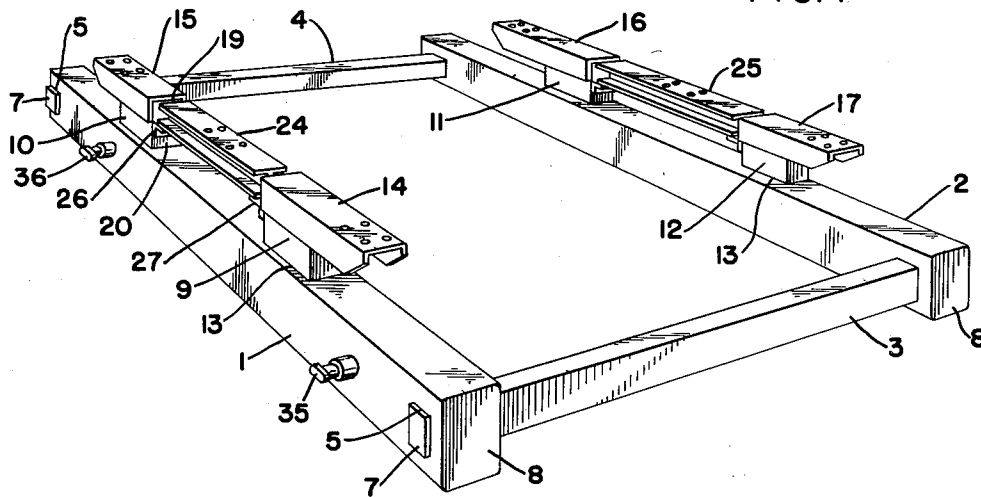


FIG. 3

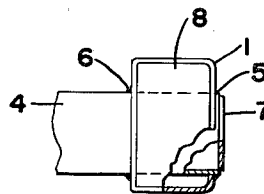


FIG. 4

INVENTOR.
WALTER J. PARKS

BY

Jay & Jay
ATTORNEYS

July 24, 1962

W. J. PARKS

3,045,824

BASE FRAME FOR VIBRATING SCREENING APPARATUS

Filed Nov. 20, 1959

2 Sheets-Sheet 2

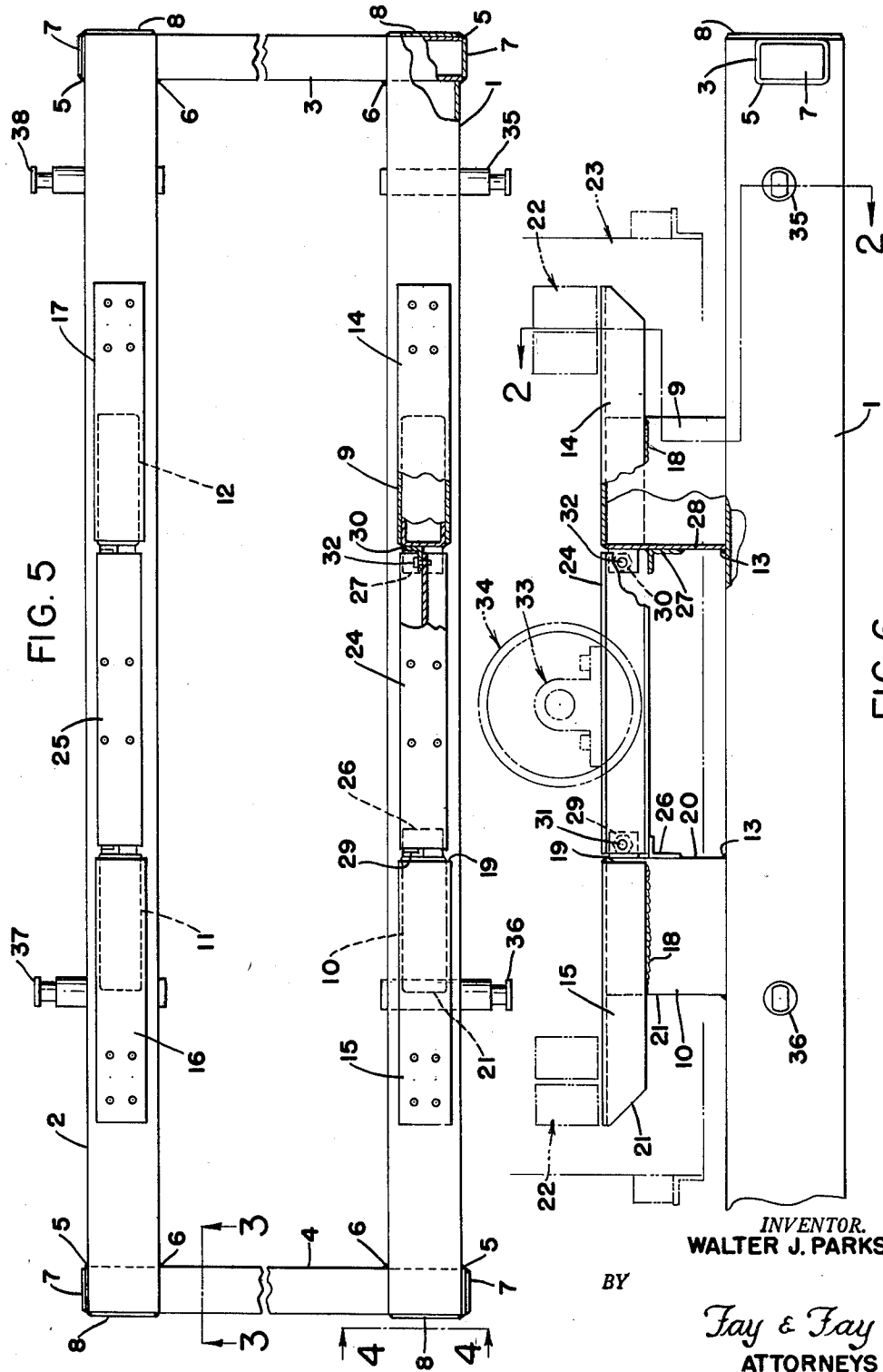


FIG. 5

FIG. 6

INVENTOR.
WALTER J. PARKS

BY

Fay & Fay
ATTORNEYS

1

3,045,824

BASE FRAME FOR VIBRATING SCREENING APPARATUS

Walter J. Parks, Cleveland, Ohio, assignor to The W. S. Tyler Company, Cleveland, Ohio, a corporation of Ohio

Filed Nov. 20, 1959, Ser. No. 854,420
7 Claims. (Cl. 209—412)

This invention, as indicated, relates to base frames for vibrating screening apparatus and is a continuation-in-part of my copending application, Serial No. 418,982, filed March 26, 1954, now Patent No. 2,925,911, dated February 23, 1960.

In the field of vibrating screening apparatus the construction of efficient base frames has always been a problem. Obviously, in machinery of this sort the ability of the base frame to withstand deflections is an important consideration since the frame is subjected to forces (or loads), from both the operation of the screen mechanism and impact loads from material on the screen surface, which are constantly changing in magnitude and direction at the operating frequency of the mechanism. To avoid vibrational movements in the base frame members stiffness and rigidity of the base frame are indispensable characteristics.

The known solution to this problem has been to use a standard structural beam or girder extending generally lengthwise adjacent to an outside of each side plate of the screen body. The outside surface of the lower flanges would be located several inches below the bottom edges of the side plates and another set of structural beams would be bolted or welded to each bottom surface to act as cross members for tying the beams together to form the completed framework. The beam height would then be selected to reach up to the correct elevation to accept the parts connected to the actuating mechanism. On many designs of screens this height requirement very often dictated the use of a much deeper, heavier and therefore less economical main beam than required on the basis of strength or stiffness. In addition, the multiplicity of joints with the attendant problems of gusseting, knee bracing and other stiffening required for proper design and operation consumed an unduly large amount of engineering and fabricating time and at best only produced a base frame vastly inferior in stiffness, strength and useability to the disclosed design.

In this era of high labor cost it is imperative that all parts of the screen body be accessible for service and maintenance. In the older designs it is obvious that the solid beam side area effectually blocks off access to the lower part of the screen body side plate making servicing and maintenance difficult both in working on bolts and screen cloth tensioning devices in this area and in removing the balance wheels which centrally extend below the top surface of the beams. In the latter case it is often necessary to raise the entire body and actuating mechanism free of and above this top flange before a wheel can be pulled.

To be efficient a base frame must be designed to allow access to the side areas of the screen body side plates and also to any actuating mechanism parts that must be periodically removed for inspection or repair.

A very progressive step in the right direction was taken when the base frame disclosed in my copending application, Serial No. 418,982, filed March 26, 1954, now Patent No. 2,925,911, dated February 23, 1960, was developed and of which the present application is a continuation-in-part. In that application it was proposed to solve various of the attendant problems discussed above by means of a tubular base frame having side members and

2

cross members and with a plurality of pedestals mounted on the side members in a symmetrical fashion. These pedestals were provided at their tops with platforms upon which the resilient screen body was adapted to be supported by means of resilient mountings. In the machine shown in that co-pending application, the main bearings were provided with horizontally extending and oppositely directed arms which were resiliently mounted on the platforms of the pedestals.

The above arrangement has proven very satisfactory but, of course, is limited to actuating mechanisms that have the horizontally extending arms which reach out to the pedestals for fastening resiliently thereon.

In other designs of actuating mechanisms wherein the member that fastens to the base frame is more compact (without extending arms) and particularly where it is in the form of a standard pillow block bolted rigidly to the base frame other means must be efficiently applied to reach out to the raised pedestals.

All of these various considerations led eventually to the development of the instant invention by which it is proposed to mount the bearings for the screen body on a rigid beam attached between two pedestals carried on each of the side framing members. Bearing in mind the fact that it is highly desirable if not absolutely necessary that this rigid beam be kept as short as possible in order to minimize bending moments, it will become immediately obvious that the pedestals must be kept as close together as is practically feasible. On the other hand, however, it must be remembered that in order to provide the proper amount of stability for the vibrating screen body, it is necessary that the points at which the same is mounted to the base frame be spaced a wide distance from each other. In order to accomplish this, the platforms attached to the pedestals and upon which the vibrating screen body is adapted to be mounted are provided with extensions directed away from the ends of the rigid beam. In this manner, the beam may be constructed short enough and the vibrating screen body may be mounted at points which are spaced wide enough from each other in order to satisfy the prerequisites of good design practice.

One very distinct advantage which the present design offers is that it allows for very easy maintenance of the components of the actuating mechanism for the vibrating screen body. By removably mounting the rigid beam between the pedestals on each side framing member, it is a simple matter to detach the beam and slide it and the main bearing which is attached thereto out of position when it is desired to service the bearing or the balance wheel mechanism which lies immediately behind it. By virtue of the fact that the pedestals are spaced from one another, it is very easy for a workman to gain access to the balance wheel and the like which is generally aligned with the space defined between the pedestals.

It is an object, therefore, of this invention to provide a base frame for vibrating screen bodies which will allow the bearing on the actuating mechanism to be mounted on a rigid beam of optimum length, while at the same time permitting the mounting of the screen body itself at widely spaced intervals for satisfactory stability.

It is even a further object of the invention to provide a base frame for vibrating screen bodies which is so designed as to allow easy maintenance of the various components of the actuating mechanism.

These and other objects will be apparent from the detailed description to follow:

In the drawings:

FIG. 1 is a perspective view of a base frame for vibrating screen bodies and is designed in accordance with the principles of the invention.

FIG. 2 is a view partly in section of a portion of the base frame and taken along line 2—2 of FIG. 6.

3

FIG. 3 is a view partly in section of a portion of the base frame and is taken along line 3—3 of FIG. 5.

FIG. 4 is an end view partly in section of one of the side framing members and is taken along line 4—4 of FIG. 5.

FIG. 5 is a top plan view of a base frame constructed in accordance with the principles of the invention; and

FIG. 6 is a partial side elevation partly in section of the base frame of FIG. 5.

Referring now more particularly to the drawings, I have shown a base frame for vibrating screen bodies and including a pair of tubular side framing members 1 and 2, fixedly attached to one another by means of tubular cross members 3 and 4. It will be observed from an examination of the drawings that the end portions of the cross members 3 and 4 extend completely through the side framing members 1 and 2 and are welded or otherwise affixed on both sides of each side framing member as at 5 and 6.

By connecting the cross members 3 and 4 in this manner, a frame structure is provided which is extremely rigid and highly resistant to deflection. The tubular shape of members 1, 2, 3 and 4 provides a very efficient section both in stiffness and in strength not only in the direction of the two principal axes of the section but also in torsion to resist all twisting forces. This tubular shape therefore gives for a given or lesser weight of material a stiffer and stronger frame in all directions than can be obtained from I-beam or channel construction.

Preferably, the ends of the sides framing members 1 and 2 and the cross members 3 and 4 may be closed by means of plates fixedly attached thereto as indicated, for example, at 7 and 8.

Mounted on the tops of side framing members 1 and 2 and extending upwardly therefrom are tubular pedestals 9, 10, 11, and 12. The pedestals are fixedly attached to the side framing members as by means of welding 13 or the like as seen in FIG. 2. It will be noted that the pedestals 9 and 10 are disposed in substantially directly opposed relationship to the pedestals 11 and 12.

Fixedly attached to the tops of the pedestals are elongated platforms 14, 15, 16 and 17. These platforms are provided with a generally U-shaped configuration in cross-section and are mounted with the legs thereof extending in a downward direction so as to lie snugly against the inner and outer sides of the pedestals, as best seen in FIG. 2. A weld or the like 18 may be used to secure each platform in position upon its associated pedestal.

It will be observed that each platform is mounted on its associated pedestal in a non-symmetrical manner. That is to say, that the end 19 of the platform 15, for example, is substantially flush with the surface 20 of the pedestal 10. The other end 21 of the pedestal 15 is spaced a sufficient distance from the surface 21 of the pedestal 10 as to provide an overhang or extension upon which is adapted to be supported the resilient mounting means 22 shown in phantom for the vibrating screen body 23, a portion of which is also shown in phantom in FIGS. 2 and 6.

Rigid beams 24 and 25 are detachably mounted between pedestals 9, 10 and 11, 12 respectively. For purposes of illustration, I have shown the beams 24 and 25 as being generally I-shaped in cross-section.

One very satisfactory manner of mounting the beams 24 and 25 in position contemplates the use of a pair of L-shaped brackets in connection with each beam. These brackets as shown, for example, at 26 and 27 of FIG. 6 are fixedly attached to the pedestals 10 and 9 respectively with one leg of the bracket 26 lying along the surface 20 of the pedestal 10 and one leg of the bracket 27 lying along the surface 28 of the pedestal 9. The other leg of each bracket is disposed in a horizontal plane to thereby provide a support surface for the bottom flange of the beam 24. As will be observed, the beam 24 when resting on the brackets 26 and 27 lies in the same plane as the top faces of the platforms 14, 15, 16, 17 and the top

4

face of the beam 25. In order to locate the beam 24 in a lateral position and to provide a means for fixedly attaching the same in place, another pair of L-shaped brackets 29 and 30 are provided which are attached to the surfaces 20 and 28 respectively of the pedestals 10 and 9. The brackets 29 and 30 are so located on the surfaces 20 and 28 that the surfaces of the outstanding legs lie in a common vertical plane so that the web of the beam 24 may be attached at both ends thereof to the brackets 29 and 30 as by bolts 31 and 32. By this means the beam 24 may be held detachably but rigidly in the vertical and lateral directions. It will be understood, of course, that the beam 25 is attached between the pedestals 11 and 12 in the same manner.

Journalled in each bearing is a shaft with balance wheel as shown, for example, in phantom at 34 in FIG. 6.

If desired, lugs 35, 36, 37 and 38 may be provided for suspending the base frame from a support means.

It is evident from the foregoing description that by means of the instant invention, a base frame has been provided which allows the bearing members of the actuating mechanism for the vibrating screen body to be rigidly mounted to the frame. More important, however, the means by which these bearings are mounted lends itself to relatively easy maintenance processes as contrasted with previously known base frame design. It will be immediately obvious that it is a relatively simple matter to remove the bolts 31 and 32 and slide the beam 24 along with its associated bearing 33 out of position from between the pedestals 9 and 10. This allows easy access to both the bearing itself and to the balance wheel mechanism 34 which lies behind the bearing.

By providing platforms for the pedestals which extend at their ends beyond the pedestals it is possible to provide relatively wide spacing between the resilient supports 22 for the purposes of stability, while at the same time reducing the length of the beam 24 to a minimum in order to hold the bending moments on the same down to a satisfactory level.

While I have illustrated the invention in connection with only a single embodiment for ease of description, it will be immediately apparent to one possessing but ordinary skill in the art that the illustrated form of the invention constitutes but one of many forms to which the principles of the invention may be applied. It is my desire, therefore, that the specification and drawings be considered as merely illustrative, and that I be limited only by the spirit and scope of the appended claims.

I claim:

1. In a vibrating screening apparatus a base frame combining the characteristics of maximum strength and stiffness and minimum weight and including a pair of laterally spaced tubular side framing members rigidly interconnected by means of tubular cross-members, a pair of rigid upright pedestals rigidly mounted on each side framing member with a substantially unobstructed area being defined therebetween, each pedestal on one of the side framing members having a free end and being disposed in generally opposed relationship to the corresponding pedestal on the other, a platform provided on the free end of each pedestal in asymmetrical relationship to the longitudinal axis of the pedestal with each platform lying in substantially co-planar relationship with the others and being adapted to have supported thereon a mounting member for a vibrating screen body, and a relatively short rigid bearing support beam removably rigidly mounted between the pair of pedestals on each framing member.

2. A base frame as defined in claim 1 in which the bearing support beams are substantially co-planar with each other and with the platforms provided on the pedestals.

3. A base frame as defined in claim 1 in which the pedestals are tubular.

4. A base frame as defined in claim 1 in which the asymmetrical relationship between the platform and longitudinal axes of the pedestals provides a portion of each platform adapted to support a mounting for a vibrating

screen body which is offset with respect to the longitudinal axis of the pedestal with which it is associated in a direction towards the nearest end of the side framing member with which it is associated.

5. In a vibrating screening device, a generally rectangular base frame combining maximum strength and stiffness with minimum weight, a pair of laterally spaced tubular side framing members rigidly attached to one another by means of cross-members, a pair of upright rigid pedestals mounted on each side framing member and spaced from each other to define therebetween a substantially unobstructed space, an elongated platform provided at the upper end of each pedestal and defining therewith an inverted L-shaped configuration diverging in a direction towards the nearest end of the side framing member upon which the same is mounted, a relatively short rigid bearing support beam detachably rigidly mounted upon and between each said pair of pedestals, and means

to permit lateral removal of each bearing support beam from between its respective pair of pedestals.

6. A base frame as defined in claim 5 in which the platforms are substantially co-planar with one another.

7. A base frame as defined in claim 5 in which each platform is channel-shaped in cross section with the portions thereof forming the legs of the channel being fitted over the upper end of the pedestal with which the platform is associated.

References Cited in the file of this patent

UNITED STATES PATENTS

1,914,226	Wettlaufer	June 13, 1933
1,923,229	Robins	Aug. 22, 1933
2,260,386	Krohn	Oct. 28, 1941
2,874,841	Peterson	Feb. 24, 1959
2,925,911	Parks	Feb. 23, 1960