May 5, 1959 A. WORMSER 2,885,079

APPARATUS FOR SCREENING AND COMMINUTING

Filed Jan. 7, 1957

Fig. 1.

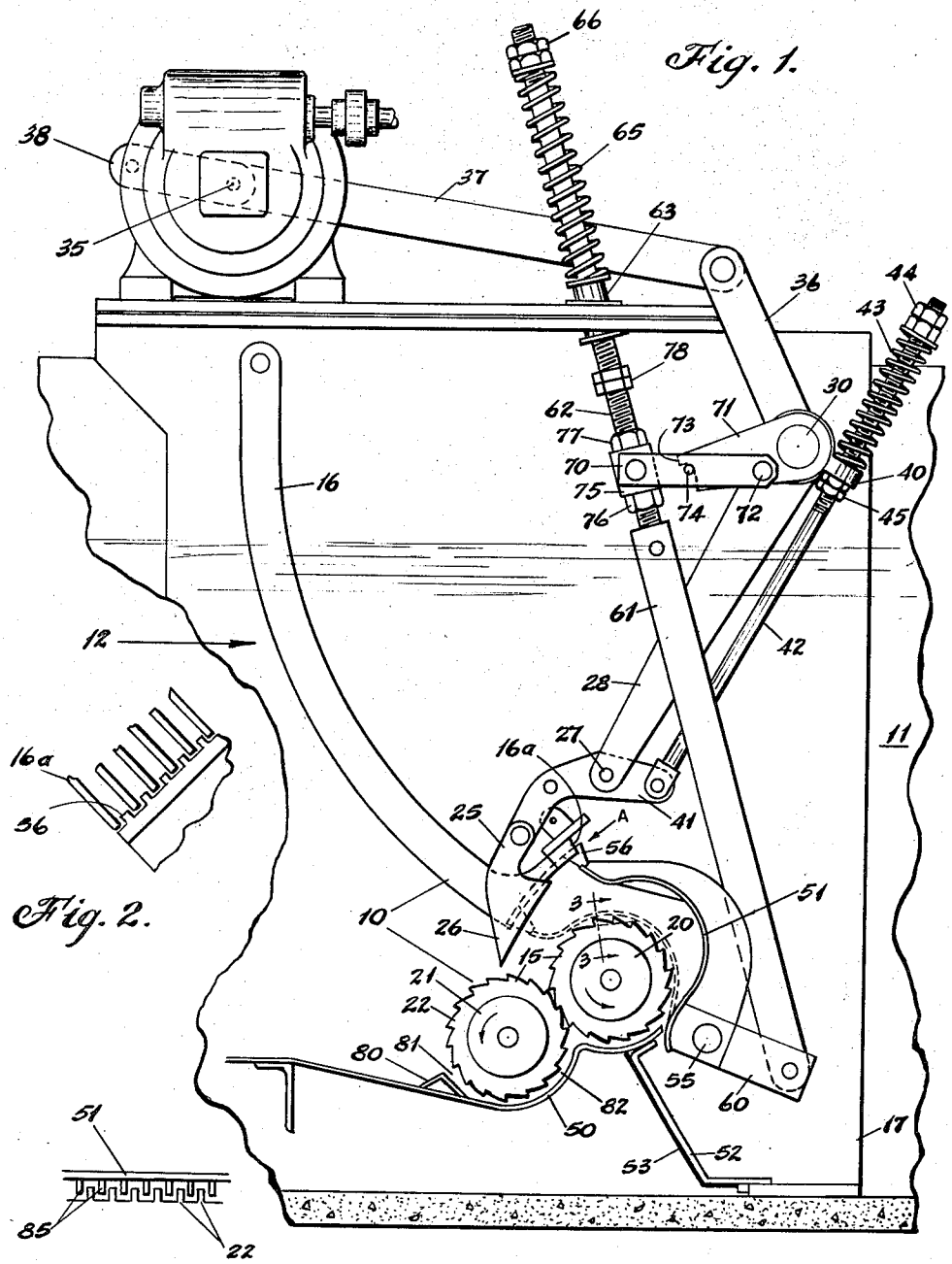


Fig. 2.

Fig. 3.

United States Patent Office 2,885,079 Patented May 5, 1959

2,885,079

APPARATUS FOR SCREENING AND COMMINUTING

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Application January 7, 1957, Serial No. 632,694

12 Claims. (Cl. 210—154)

This invention relates to an apparatus for intercepting solids in a flowing stream of liquid, such as sewage or other waste liquids, and comminuting the solids. More specifically, the invention relates to improvements in the combination of a screen and comminutor described in my co-pending application, Serial No. 360,039, now Patent No. 2,781,915 of which this application is a continuation-in-part.

In the said co-pending application a comminutor is mounted in the lower portion of a channel through which the sewage or other liquid arrives. The comminutor comprises a pair of rollers mounted horizontally across said channel with their longitudinal axes parallel to one another and provided with projections on their circumferences arranged so that, upon rotation of the rollers, the projections on one roller pass those on the other with small clearance. The rollers are rotated in the same direction but at different speeds. A bar screen extends across the channel from an elevation above the maximum liquid level in the channel downwardly to an elevation adjacent the comminutor and has a rearwardly extending end portion. The screen is cyclically cleaned by a reciprocating rake. About the downstream side of the rollers and along the top of the faster roller plates are provided which serve the double function of preventing not fully comminuted material from reaching the downstream portion of the channel and of holding the material entering the space between the rollers and the plates against the rollers, so that the material is moved by the rotation of the rollers upwardly around the rollers and into the bite. These plates are made of resilient material or are hingedly supported and spring pressed toward the rollers, so that they are capable of limited movement away from the rollers to permit passage of larger than normal pieces of material. The end portion of the plate adjacent the top of the fast roller is provided with prongs which are interlaced with the rearwardly extending end portion of the bar screen, thus closing the gap between the lower end of the screen and the comminutor.

With this construction, a part of the lowermost end of the bar screen of said co-pending application cannot be cleaned by the rake due to the presence of the interlacing prongs. In operation of the apparatus of said co-pending application I have found that particles tend to accumulate between the lower ends of the screen bars. The occasional limited movement of the interlacing prongs between the screen bars, which is caused by larger pieces of material passing between the rollers and the pronged plate and pressing the pronged plate away from the roller, does not suffice to prevent or remove such accumulations of particles, and eventually they could build up to a degree to interfere with the proper movements of the rake and of the plate.

I also found in actual operation that material taken around by the fast roller to the bite sometimes was carried off by the slow roller before it had been taken into the bite, whereby comminution was slowed down.

The purpose of the invention is to correct these conditions and to increase both the speed of comminution and the reliability of operation of the comminutor. The invention relates primarily to improvements in the means for cleaning the lower end of the bar screen. Means are also provided to more effectively take material which has been carried close to the bite by the fast roller, into the bite.

It is an object of this invention to improve the comminutor-bar screen combination of my said co-pending application.

Another object is to provide means for cyclically cleaning the lower end of the bar screen of said co-pending application.

Another object is to provide the comminutor of my said co-pending application with improved means for holding material to be comminuted against the rollers of the comminutor until they are taken into the bite.

Another object is to provide means for preventing entry of oversized objects into the space between the rollers and the plates of the comminutor of said co-pending application.

Other objects will become apparent upon consideration of the detailed description and the claims which follow.

To permit cleaning of the lowermost part of the screen I provide means for effecting a cyclic movement of the pronged plate away from the fast roller during the end portion of each cycle of reciprocation of the rake, whereby the prongs are swung out of the path of travel of the rake as it approaches the lower end portion of the screen, thus permitting the rake to clean the lowermost portion of the bar screen during each of its cycles of reciprocation. This end portion is further cleaned by the motion of the prongs which swipe the lower end portion of the screen in a direction perpendicular to that of the rake and alternately with the rake. I also shape the rake members so that they clean a wide area of the rearwardly extending end portion of the screen.

A cyclic movement of the pronged plate would not be permissible with the elastic construction of all feeder plates of said co-pending application. In the embodiment of said application the three plates move only away from the rollers in case an oversized object passes between the rollers and the plates; most of the time the plates are stationary. Therefore, if a cyclic movement of the pronged plate were effected, then, each time the pronged plate would be swung away from the fast roller at the end of a cycle of reciprocation of the rake, a wide gap would be left between the rearwardly swinging pronged plate and the then stationary adjacent plate. It is clear that only a small gap whose size remains the same under all conditions can be tolerated between the plates, as otherwise incompletely comminuted material might reach the downstream portion of the channel. Obviously, the size of a gap between two members moving independently of each other will vary.

To overcome this difficulty and simplify the over-all plate construction, I use, instead of two of the elastic plates of the prior construction, one rigid plate and support it rigidly, leaving only the pronged plate hinged and spring pressed; and I form the pronged plate so that the gap between the adjacent ends of the two plates remain uniform for all positions of the pronged plate.

Using one plate of rigid material which is rigidly supported requires a further change in the construction of the comminutor of said copending application. Since the rigid plate would not permit passage of oversize objects, their entry in the space between the plate and the rollers must be prevented. To this end I provide what may be termed an entry baffle to this space which affords an opening between itself and the slow roller of substantially

the same cross sectional area as that of the space between the rigid plate and the rollers.

I also provide means counteracting the tendency of the slow roller to carry off material taken close to the bite by the fast roller before it has been taken into the bite.

The invention will be more readily understood by reference to the drawings, wherein:

Figure 1 is a side elevation of a screen and comminutor according to the invention, with part of the framing removed and the comminutor drive means omitted;

Figure 2 is a view of the interlacing end portions of the screen and pronged plate in the position shown in full lines in Figure 1 and seen in the direction of the arrow A of Figure 1; and

Figure 3 is a cross sectional view along line 3—3 of Figure 1.

Referring to Figure 1, a bar screen and comminutor assembly **10** is installed in a channel **11** through which sewage or other waste liquid flows in the direction indicated by arrow **12**. The comminutor **15** is mounted in the lower portion of the channel **11**, so that at times of lowest flow it will be at least partially submerged. The screen **16** extends from an elevation above the maximum liquid level in the channel **11** downwardly to adjacent the comminutor **15**. The assembly may be enclosed in a framework **17** and can be installed in the channel **11** as a unit.

The comminutor **15** comprises a pair of rollers **20** and **21**, which extend across the channel **11** and have their longitudinal axes arranged parallel to one another. The rollers **20** and **21** have spaced projections or teeth **22** on their circumferences. The axes of the rollers are so spaced from one another and the teeth arranged in such planes of rotation that no point of the profile of one of the rollers interferes with any point of the profile of the other roller and that, upon rotation of the rollers, the projections of one roller enter the spaces between the projections of the other roller but pass the projections with small clearance.

The rollers are driven by any suitable means, not shown, in the same direction, for example, counterclockwise, as indicated by the arrows in Figure 1, but at different speeds. The relative speeds between the fast roller **20** and the slow roller **21** may be of the order of 5 to 1. A friction clutch may be interposed in the drive of the fast roller and an overload device may be provided, as is well known in the art.

As shown in Figure 1, the screen **16** is curved and has a rearwardly extending lower end portion **16***a*. The upper and lower ends of the screen **16** are supported from the frame **17**.

Material intercepted by the screen **16** is moved along the screen toward the comminutor **15** by a reciprocating rake **25**. The rake **25** has rake members **26** corresponding in number to the openings between the bars of the screen **16** and extending into said openings from the downstream side of the screen, with their tips on its upstream side. The rake members **26** are keyed to, and supported by a shaft **27**. The shaft **27** is hingedly supported at its ends by arms **28** which in turn are keyed to a shaft **30**. A cyclic reciprocating motion is imparted to the shaft **30** by any suitable means, such as a shaft **35** to which it is connected by means of an arm **36**, connecting rod **37** and crank **38**. The shaft **35** is continuously driven counterclockwise by any suitable means, not shown.

Each arm **28** has a rearward projection **40** and the two outermost rake members **26** have each a projection **41**. Each projection **41** is hinged to a spring rod **42** which is urged upwardly by a spring **43**. The lower end of each spring **43** abuts the projection **40** of the respective arm **28**, and the upper end abuts nuts **44** which hold the spring under the proper tension. Upward movement of each of the springs **43** is limited by adjustable locknuts **45** which in normal position touch the respective projection **40**.

Due to this construction the arms **28** and rake members **26** normally move together on their upward and downward trip. A motion of the rake members **26** relative to the arms **28**, due to the hinging of shaft **27**, can be only in clockwise direction. Such a motion of the rake members relative to the arms **28** happens when motion of the crank **38** tends to move the rake **25** downwardly while the rake members **26** are prevented from following by meeting an obstacle which may be pinched in the screen **16**. Hinging of the shaft **27** permits the rake members to swing rearwardly to within or behind the bar screen **16** to pass the obstacle.

The structure so far described is that of said co-pending application and is not claimed herein except in as far as it cooperates with the improved means for cleaning the lower portion of the bar screen **16** and for carrying material to and taking it into the bite of the rollers **20—21**.

As in the embodiment of said co-pending application, a plurality of feeder plates is mounted on the downstream side of the rollers **20** and **21**. One of these plates extends upwardly about the fast roller **20** and has an upper pronged end interlaced with the lower end of the bars of the screen **16**. However, while in said co-pending application three feeder plates were used and all were either made of springy material, or were hingedly supported and spring pressed against the rollers, in the improved embodiment of this invention I use only two plates, **50** and **51**, and make one of these, **50**, of rigid material and affix it to a rigid support **52**. The support **52** may be in the form of a plurality of individual posts, or it may be a single plate, supported from the bottom of the frame **17**. If posts are used, they may be covered by a thin plate **53** of sheet metal or the like to guide the stream of water coming down over the downstream side of the plate **51** and prevent formation of a whirl which might deposit comminuted material under the stationary plate **50**.

The pronged plate **51** is also made of rigid material but is hingedly supported at **55** and spring pressed toward the fast roller, as will be described below. The prongs **56** of the plate **51** enter a small distance between the bars of the end **16***a* of the screen **16**, as best shown in Figure 2. To keep this distance uniform when plate **51** swings around its pivot **55**, the rearwardly extending end portion **16***a* of the screen **16** is shaped to form an arc of a circle about pivot **55**.

I provide means, which will be described below, whereby the plate **51** is moved cyclically away from the fast roller **20** once during each cycle of reciprocation of the rake **25** and at the time when the rake approaches the lower end of the screen **16**. To prevent that during the cyclic movement of plate **51** a gap opens between the lower end of plate **51** and the upper end of stationary plate **50**, through which not fully comminuted material could pass to the downstream side of the channel **11**, the lower end of the plate **51** is formed as an arc of a circle around its pivot **55**. Due to this construction the small gap between the plates **50** and **51** will remain the same for all positions of the plate **51**. The rake members **26** are shaped so that they wipe a wide area of the rearwardly extending portion **16***a* of the screen, and the stroke of the rake **25** is adjusted so that the rake members extend in their lowermost positions beyond the screen, as clearly shown in Figure 1.

In order to obtain a cyclic movement of the plate **51** away from the roller **20** during the end of the downward travel of the rake **25**, the plate **51** is connected with the shaft **30** to which the arms **28** of the rake **25** are keyed, in the following manner: An arm **60** is fastened to the plate **51** and at its outer end pivotally connected with the lower end of a rod **61**. A second rod **62** is pivotally connected to the upper end of rod **61**. The lower part of

the rod 62 is threaded. The rod 62 is guided in a guide 63 which is supported from the frame 17. The upper portion of the rod 62 is encircled by a spring 65 which abuts with its lower end against the guide 63 and is held under proper compression by lock nuts 66 threaded on the upper end of the rod 62. Links 70 (only one of which is visible in Figure 1) are pivoted to the rod 62 with one end and with the other end to an arm 71 at 72. The arm 71 in turn is keyed to and moves with the shaft 30. The free end of the arm 71 is shaped to form a nose 73, and a cross member 74 between the links 70, is located at a distance from pivot 72 to register with nose 73. When rake 25 is in an up position, the nose 73 is above and spaced from member 74, and the plate 51 is spring pressed against the fast roller 20.

While the rake 25 travels downwardly, the plate 51 remains spring pressed against the fast roller 20 until the rake approaches the lowermost portion of the screen 16, at which time the nose 73 engages the cross member 74. This compresses spring 65, whereby feeder plate 51 is moved outwardly from the roller 20 and the prongs 56 of the plate 51 are swung rearwardly from their normal positions shown in dotted lines in Figure 1 to the positions shown in full lines therein. In their end position the prongs 56 extend somewhat beyond the rearwardly extending end portion 16*a* of the screen 16. With the prongs 56 thus out of the way, the rake 25 can complete its downward travel and due to its shape clean the entire vertical portion and the front part of the rearwardly extending portion of the screen, while the entire rearwardly extending portion 16*a* is swiped by the movement of the prongs.

To permit adjustment of the outward motion of the plate 51, the pivot point of links 70 on rod 62 is made adjustable. For this purpose the links are pivotally connected to an internally threaded collar 75 which is movable along the lower threaded portion of the rod 62 and is held in position by stop nuts 76 and 77. When the plate 51 is spring pressed toward the roller 20, the clearance between the plate 51 and the roller 20 is preferably the same as between plate 50 and roller 21, to provide a passageway between the rollers and plates of substantially uniform cross sectional area. The clearance between plate 51 and roller 20 is adjustable by setting lock nuts 78 at a suitable point along the rod 62. The lock nuts 78 will hit the guide 63 upon expansion of the spring 65 and thus limit the expansion in accordance with their position.

Since plate 50 is rigid and cannot move away from the rollers to permit passage of material which is larger than the normal distance between the plate and the rollers, I baffle the inlet to the space between the roller 21 and the plate 50 to prevent such material from entering the space. The dam-shaped baffle 80, which may be affixed to the plate 50 as by welding, or may be integral therewith, restricts the inlet opening 81 to the passageway 82 formed between the plate 50 and the roller 21 substantially to the cross sectional area of said passageway.

As shown in Figure 3, the teeth 22 of the rollers 20 and 21 are rectangular in cross section. The portion of the feeder plate 51 above the fast roller 20 is provided on its inside with ribs 85 which extend into the spaces between the teeth 22 of the roller 20. The ribs 85 serve to press material carried around by the fast roller 20 into the spaces between its teeth so that it sticks firmly to the teeth. Since the ribs 85 co-act with the teeth 22 of roller 20 at a location where the teeth approach the bite, the material is safely carried into the bite without interference by the slow roller 21.

It will be seen that the screen-comminutor combination of my said co-pending application has been improved in important respects, to afford a more reliable operation of the entire device.

I claim:

1. In an apparatus for intercepting solids in a flowing stream of liquid and comminuting them, comprising the combination of a stationary screen having a rearwardly extending lower end portion, a reciprocable rake adapted to move solids intercepted by said screen along said screen, means for cyclically reciprocating said rake, comminuting means positioned in said stream to receive said solids from said rake, and wall means mounted adjacent the downstream side of said comminuting means and having a pronged end portion interlaced with said rearwardly extending end portion of said screen, said wall means preventing escape of not fully comminuted material to downstream of said screen and comminuting means, the combination with said wall means of means for cyclically moving said pronged end portion to the rear end of said rearwardly extending end portion of said screen and out of the path of travel of said rake at a time when said rake approaches said end portion of said screen.

2. In an apparatus for intercepting solids in a flowing stream of liquid and comminuting them, said apparatus including a stationary bar screen, a reciprocable rake adapted to move solids intercepted by said screen along said screen, means for cyclically reciprocating said rake, and comminuting means positioned in said stream adjacent one end position of said rake, the combination with said comminuting means of a pair of feeder plates adjacent the downstream side of said comminuting means, one of said plates being rigidly supported and the other plate being pivotally supported and spring pressed toward said comminuting means, said pivotally supported plate having a pronged upper end interlaced with the lower end portion of said screen, means restricting the entrance to the space between said comminuting means and said plates to substantially the cross sectional area of said space, and means effective to cyclically move said pivotally supported plate against the spring pressure away from said comminuting means and swing its pronged upper end out of the path of said rake at a time when said rake, during a cycle of reciprocation, approaches said one end position, said lower end portion of said screen being shaped so that said pronged upper end remains interlaced therewith in all of its positions.

3. In an apparatus for intercepting solids in a flowing stream of liquid and comminuting them, said apparatus including a stationary bar screen, a reciprocable rake adapted to move solids intercepted by said screen along said screen, means for cyclically reciprocating said rake, and comminuting means positioned in said stream adjacent one end position of said rake, the combination with said comminuting means of a pair of feeder plates adjacent the downstream side of said comminuting means, one of said plates being rigidly supported and the other plate being pivotally supported and spring pressed toward said comminuting means, said pivotally supported plate having a pronged upper end interlaced with the lower end portion of said screen, and means effective to cyclically move said pivotally supported plate against the spring pressure away from said comminuting means and swing its pronged upper end out of the path of said rake at a time when said rake approaches said one end position, the lower end portion of said screen being shaped so that said pronged end of said plate remains interlaced therewith in all of its positions.

4. In an apparatus for intercepting solids in a flowing stream of liquid and comminuting them, said apparatus including a stationary bar screen, a reciprocable rake adapted to move solids intercepted by said screen along said screen, means for cyclically reciprocating said rake, and comminuting means positioned in said stream adjacent one end position of said rake, the combination with said comminuting means of a pair of feeder plates adjacent the downstream side of said comminuting means, one of said plates being rigidly supported and the other plate being pivotally supported and spring pressed toward said comminuting means, said pivotally supported plate having a pronged upper end interlaced with the

lower end portion of said screen and a lower end shaped as an arc about its pivot point, said lower end portion of said screen being shaped as an arc about said pivot point, and means effective to cyclically move said pivotally supported plate against the spring pressure away from said comminuting means and out of the path of said rake during each cycle of reciprocation of said rate at the time when said rake approaches said one end position.

5. In an apparatus for intercepting solids in a stream of liquid flowing through a channel and comminuting them, said apparatus including a stationary bar screen, a reciprocable rake adapted to move solids intercepted by said screen along said screen, means for cyclically reciprocating said rake, and comminuting means positioned in said stream adjacent on end position of said rake, the combination with said comminuting means of a pair of feeder plates adjacent the downstream side of said comminuting means, a rigid support for one of said plates, said rigid support including a solid plate extending across said channel, a pivot support for the other of said plates, and spring means urging said other plate toward said comminuting means, said pivotally supported plate having a lower end shaped as an arc about said pivot support and a pronged upper end interlaced with the lower end portion of said screen, and means effective to cyclically move said pivotally supported plate against the spring pressure away from said comminuting means and swing its pronged upper end out of the path of said rake at the time when said rake, during a cycle of reciprocation, approaches said one end position, said lower end portion of said screen being shaped so that said pronged upper end remains interlaced therewith in all its positions.

6. In an apparatus for intercepting solids in a flowing stream of liquid and comminuting them, comprising the combination of a stationary bar screen, a reciprocable rake adapted to move solids intercepted by said bar screen along said screen, means for cyclically reciprocating said rake, and comminuting means positioned in said stream to receive said solids from said rake, said comminuting means including a pair of rollers having longitudinal axes parallel to one another across said stream, teeth on the surface of said rollers, said rollers being so spaced and said teeth so arranged that at the bite the teeth of one roller enter the spaces between the teeth of the other roller and pass said teeth with small clearance, means for driving said rollers in the same direction and at different speeds, and wall means on the downstream side of said rollers and having a portion extending along the top of the faster driven roller, said wall means holding the material entering the space between said rollers and said wall means against said rollers, the combination with said wall means of a plurality of ribs extending from the side of said wall means facing said rollers and arranged so as to register with the spaces between teeth of the faster driven roller approaching the bite.

7. An apparatus for intercepting solids in a stream of liquid flowing through a channel and comminuting them, said apparatus including a straining wall interposed in said channel and having a rearwardly extending end portion, traveling means adapted to cyclically travel along said straining wall and move solids intercepted by said straining wall along said wall, drive means for said traveling means, comminuting means positioned to receive said solids from said traveling means, and wall means extending about the downstream side of said comminuting means and having a pronged end portion interlaced with said rearwardly extending end portion of said straining wall, said wall means preventing escape of not fully comminuted material to the portion of said channel downstream of said comminuting means, characterized in that said wall means comprise a rigid plate rigily supported a predetermined distance from said comminuting means, and a rigid plate hingedly supported and spring pressed toward said comminuting means, said hingedly supported plate having said pronged end portion interlacing with said rearwardly extending end portion of said straining wall, said hingedly supported plate when pressed toward said comminuting means having substantially the same distance from said comminuting means as said rigidly supported plate to provide a passageway of substantially uniform cross sectional area between said plates and said comminuting means, a dam-shaped member forming inlet means to said passageway restricted to the cross sectional area of said passageway, and means for cyclically moving during the end portion of each cycle of travel of said traveling means said hingedly supported plate away from said comminuting means to swing said pronged portion across said rearwardly extending end portion of said straining wall and out of the path of travel of said traveling means.

8. An apparatus for intercepting solids in a stream of liquid flowing through a channel and comminuting them, said apparatus including a straining wall interposed in said channel and having a rearwardly extending end portion, traveling means adapted to cyclically travel along said straining wall and move solids intercepted by said straining wall along said wall, drive means for said traveling means, comminuting means positioned to receive said solids from said traveling means, and wall means extending about the downstream side of said comminuting means and having a pronged end portion interlaced with said rearwardly extending end portion of said straining wall, said wall means preventing escape of not fully comminuted material to the downstream portion of said channel, characterized in that said wall means comprise a rigid plate rigidly supported a predetermined distance from said comminuting means, and a rigid plate hingedly supported and spring pressed toward said comminuting means, said hingedly supported plate having said pronged end portion interlacing with said rearwardly extending end portion of said straining wall, a dam-shaped member restricting the inlet to the space between said rigidly supported plate and said comminuting means, and means for cyclically moving said pronged portion of said hingedly supported plate to the rear end of said rearwardly extending end portion of said straining wall and out of the path of travel of said traveling means during the end portion of each cycle of travel of said traveling means.

9. In an apparatus for intercepting solids in a flowing stream of liquid and comminuting them in said stream, said apparatus including a screen mounted transversely of said stream and partway its depth, said screen having a rearwardly extending lower end portion, comminuting means extending across an unscreened portion of said stream adjacent said lower end portion of said screen, said comminuting means including a pair of parallel spaced rollers having spaced teeth on their circumferences, means for driving said rollers in the same direction and at different speeds, a rake reciprocable along said screen to move solids intercepted by said screen toward said comminuting means, and means for cyclically reciprocating said rake, the combination with said rollers of a pair of feeder plates adjacent but spaced from the downstream side of said rollers, one of said plates being rigidly supported and the other plate being hingedly supported and spring pressed toward the faster driven roller, said hingedly supported plate having a pronged end interlaced with said rearwardly extending end portion of said screen, baffle means restricting the inlet to the space between said plates and said rollers, ribs extending from the side of said hingedly supported plate facing said faster roller and arranged to register with the spaces between its teeth, and means cyclically moving said hingedly supported plate away from said faster roller to swing said pronged end to the rear end of said rearwardly extending end portion of the screen and out of the path of reciprocation of said rake when said rake approaches said end portion of said screen, whereby the front part of said rearwardly extending end portion is cleaned by said rake

and the entire rearwardly extending end portion is cyclically cleaned by said prongs moving in a direction perpendicular to the motion of the rake and alternately therewith.

10. In an apparatus for intercepting solids in a flowing stream of liquid and comminuting them, said apparatus including a screen mounted transversely of said stream and partway its depth, comminuting means extending across an unscreened portion of said stream adjacent an end portion of said screen, a rake reciprocable along said screen to move solids intercepted by said screen toward said comminuting means, said comminuting means having spaced teeth circumferentially arranged, means for cyclically reciprocating said rake, the combination with said comminuting means of a pair of feeder plates adjacent but spaced from the downstream side of said comminuting means, one of said plates being rigidly supported and the other plate being hingedly supported and spring pressed toward said comminuting means, said hingedly supported plate having a pronged end interlaced with said end portion of the screen, baffle means restricting the inlet to the space between the plates and said comminuting means to substantially the cross sectional area of said space, ribs extending from the side of said hingedly supported plate facing said comminuting means and arranged to register with the spaces between said teeth, and means cyclically moving said hingedly supported plate away from said comminuting means to swing said pronged end out of the path of travel of said rake when said rake approaches said end portion of said screen, said lower end portion of said screen being shaped so that said pronged end and said lower end portion remain interlaced when said pronged end is swung out of the path of travel of said rake.

11. In an apparatus for intercepting solids in a flowing stream of liquid and comminuting them, comprising the combination of a stationary screen having a rearwardly extending lower end portion, a reciprocable rake adapted to move solids intercepted by said screen along said screen, means including a driven shaft and drive means for said shaft for cyclically reciprocating said rake, comminuting means positioned in said stream to receive said solids from said rake, and wall means preventing escape of not fully comminuted material to downstream of said screen and comminuting means, said wall means being mounted adjacent the downstream side of said comminuting means and including a hingedly supported plate having a pronged end portion interlaced with said rearwardly extending end portion of said screen, the combination with said wall means of means for cyclically moving said pronged end portion to the rear end of said rearwardly extending end portion of said screen and out of the path of travel of said rake once during each cycle of reciprocation of said rake at a time when said rake approaches said end portion of said screen, said means for cyclically moving said pronged end portion comprising a rod hingedly connected to said hingedly supported plate and to said driven shaft, a spring biasing said rod and normally urging said hingedly supported plate toward said comminuting means, and means for effecting compression of said spring when said rake means approach said end portion of said screen.

12. In an apparatus for intercepting solids in a flowing stream of liquid and comminuting them, said apparatus including a stationary bar screen, a reciprocable rake adapted to move solids intercepted by said screen along said screen, means for cyclically reciprocating said rake along said screen, and comminuting means positioned in said stream adjacent the lower end position of said rake, the combination with said comminuting means and said screen of a pair of feeder plates on the downstream side of said comminuting means, one of said plates being rigidly supported and the other being pivotally supported and spring pressed toward said comminuting means, said pivotally supported plate closing the gap between the lower end portion of said screen and said comminuting means and having an upper end portion extending into the lower end portion of the path of reciprocation of said rake, means effective to cyclically move said pivotally supported plate against said spring pressure away from said comminuting means and out of the path of said rake at a time when said rake approaches the lower end portion of its path of reciprocation, the lower end of said pivotally supported plate being shaped as an arc about its pivot point, and the lower end of said screen being shaped as an arc about said pivot point, whereby said gap remains closed in all positions of said pivotally supported plate.

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UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

May 5, 1959

Patent No. 2,885,079

Arthur Wormser

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 7, line 7, for "rate" read -- rake --; line 15, for "on" read -- one --; column 8, lines 35 and 36, for "estending" read -- extending --.

Signed and sealed this 29th day of December 1959.

(SEAL)
Attest:

KARL H. AXLINE
Attesting Officer

ROBERT C. WATSON
Commissioner of Patents