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**D-8000 München 60(DE)**(54) **Universal vibrating crusher.**

(57) The present invention is a universal vibrating crusher for stone particle reduction, which represents an improvement in relation to the inventions of the applications nos. P-1997/79 and P-2110/84. The universal vibrating crusher consists of vibrating, stable and driving part. The vibrating part of the machine consists of support frames of upper impact plates fitted to the main frame.

The bearings of driving shafts with excenter weights are symmetrically placed in the upper part of the main frame, and main frame is mounted on vibration dampers.

The static part of the machine is mounted through vibration mounts on the steel frame. Upper and lower milling plates are fixed on the corresponding supports. Rectangular inlet opening is placed by its sides on upper vibrating frames.

Outlet speed of material between milling plates is regulated by pressure flap.

The machine is called: Vibrating two-roof crusher.

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## UNIVERSAL VIBRATING CRUSHER

### Field of the invention

This invention generally relates to the field of crushing, milling and particle reduction. According to International Patent Classification, this invention is classified in B 03 C2/02 group, which is defined as crushing or particle reduction by hammer mills, crushers or conical crushers.

### Technical problem

The technical problem solved by this invention is how to solve structurally the placing of upper or lower vibrating impact plates into two inclined flat or curved surfaces which are crossed in horizontal direction and how to coordinate the kinematic motion of the upper impact plates with the rotative excenters and how to place the lower impact plates under vibrating upper impact plates also in two inclined flat or curved surfaces, whereby the flat or curved surfaces of upper impact plates are placed under greater inclination.

Thereby, it should be solved that the upper impact plates, which are incorporated in the vibrating part of the machine, are moved directly by forced vertical vibrations and lower impact plates, which are incorporated in the fixed part of the machine, are to be moved by gentle vibrations induced by impacts of upper impact plates.

### Prior art

The present invention is in continuation to former inventions on the parent Yugoslav application no. P-1997/79 and additional Yugoslav application no. P-2110/84. In the patent application P-1997/79 the vibrating crusher is embodied with upper and lower impact plates lined up in two inclined surfaces. This system is asymmetrical and the inlet opening is placed sideways. In the patent application P-2110/84 the vibrating crusher is embodied with symmetrically lined up upper and lower impact plates, whereby the entire structure vibrates. The structure with upper impact plates is flexibly joined with lower supporting frame by means of the supporting frame, and is vibrating with lower supporting frame, but with different frequencies and amplitudes.

The machine driving unit consists of an electric motor and two driving shafts with excenters.

### Description of the solution to the technical problem

The technical problem is solved by a vibrating device, whereby the upper vibrating part of the machine is mounted on vibration dampers and lower static part of the machine is independently mounted on vibration mounts.

The drive generated vibrations are transmitted through the upper part of the machine. At the outlets of the crusher the pressure flaps with regulated pressure force on the outlet material are provided.

The universal vibrating crusher consists of vibrating, stable and driving part.

The machine is shown on the accompanying drawings:

Fig. 1 shows a cross-sectioned view of the vibrating machine on the left side and a view on the vibrating machine on the right side;

Fig. 2 shows a lateral view of the vibrating machine on the left side, and a lateral section of the machine on the right side.

The vibrating part of the machine, designed as the inverse letter "V", consists of two main vibration frames 14, support frames of upper impact plates 18 which are fitted to vibration frames, and impact plate 13.

The vibrating part of the machine incorporates hopper 1 for receiving the stone material.

The vibrating part of the machine is mounted through vibration dampers 16 on the support frame 9.

The static part of the machine, shaped as equal-angled triangle, consists of main frames 12, which support the support frame of lower impact plates 17 and impact plates 13. Within the static part of the machine there is a pressure flap 15 and a pressure flap drive 10. The static part of the machine is mounted through vibration mounts 11 on support frame 9.

The machine driving unit consists of an electric motor support 4 with electric motor 5, which through V-belts 8, speed reducer 7 and cardan joint shaft 6, drives the driving shaft 2 with excenter weight 3.

The machine driving unit is incorporated in the static part of the machine.

The machine is called: Vibrating two-roof crusher.

### BEST MODE STATEMENT

Special knowledge and experience are not

needed for mounting upper and lower impact plates in two inclined surfaces and for driving upper impact plates in vertical vibrations.

Impact plates must be made of friction resistant cast alloys.

Dampers should be of high elasticity rubber.

sure flap drive (10), is placed along outlet opening.

3. Universal vibrating crusher, as claimed in claim 1, wherein said upper vibrating part of the machine is mounted through vibration dampers (16) on steel frame (9) and said static part of the machine through vibration mounts (11).

#### UNIVERZAL VIBRATING CRUSHER

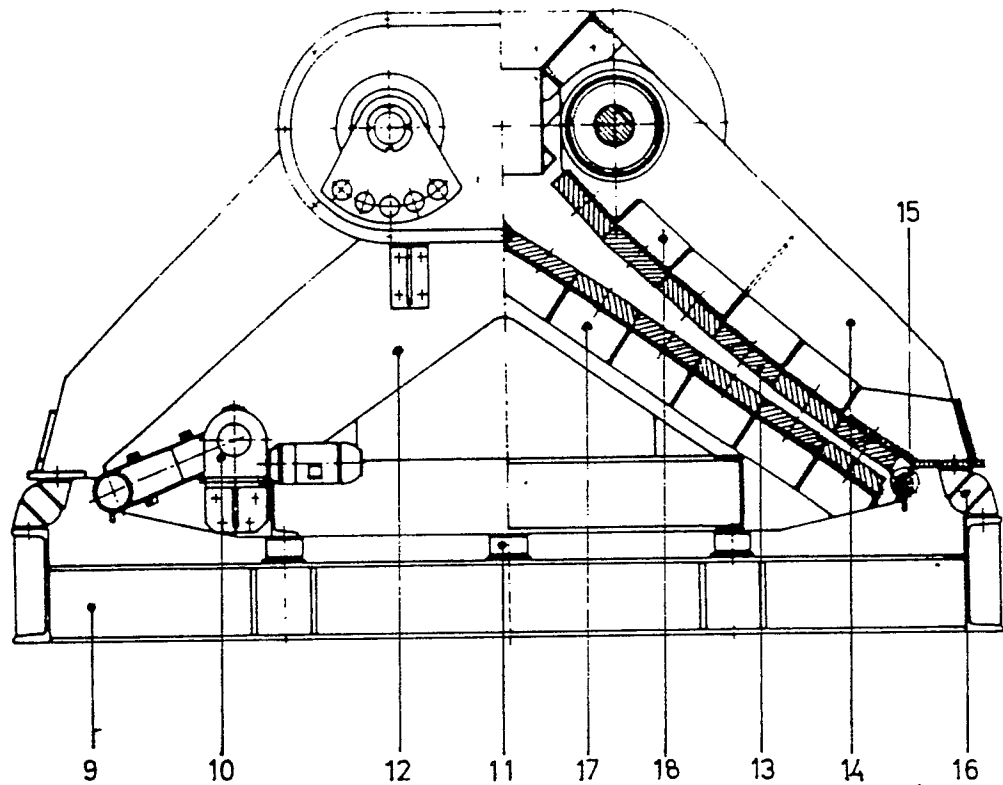
1. HOPPER	
2. DRIVING SHAFT	
3. EXCENTRIC WEIGHT	
4. ELECTRIC MOTOR SUPPORT	15
5. ELECTRIC MOTOR	
6. CARDAN JOINT SHAFT	
7. SPEED REDUCER	
8. V - BELTS	
9. SUPPORT FRAME	20
10. PRESSURE FLAP DRIVE	
11. VIBRATION MOUNT	
12. FIXED FRAME	
13. IMPACT PLATE	
14. VIBRATION FRAME	25
15. PRESSURE FLAP	
16. VIBRATION DAMPER	
17. SUPPORT FRAME OF LOWER IMPACT PLATES	
18. SUPPORT FRAME OF UPPER IMPACT PLATES	30

#### **Claims**

1. Universal vibrating crusher, wherein it comprises two main vibration frames (14) mounted through vibration dampers (16) on steel frame (12) and strengthened by support frame (18) of upper impact plates (13) lined in two symmetrical inclined surfaces, and through bearings in the upper part of main frames two driving shafts (2) with excenter weights (3) are symmetrically placed, whereby the static part of the machine, mounted through vibration mounts (11) on steel frame (12) comprises frames (12) with support frames (17) of lower impact plates (13) lined also in two symmetrical inclined surfaces under slightly decreased angle in relation to upper impact plates, and at the ends of the static part of the machine, pressure flap (15) with pressure flap drive (10) is placed, and alongside is the electric motor support (4) with electric motor (5) connected by V-belt with the speed reducer (7) which through cardan joint shaft (6) drives the driving shaft and vibrating part of the machine.

2. Universal vibrating crusher, as claimed in claim 1, wherein said flap (15) with regulating pressure on the material going out, by means of pres-

FIG. 1.



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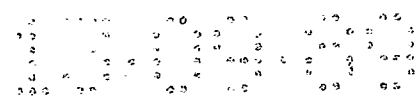
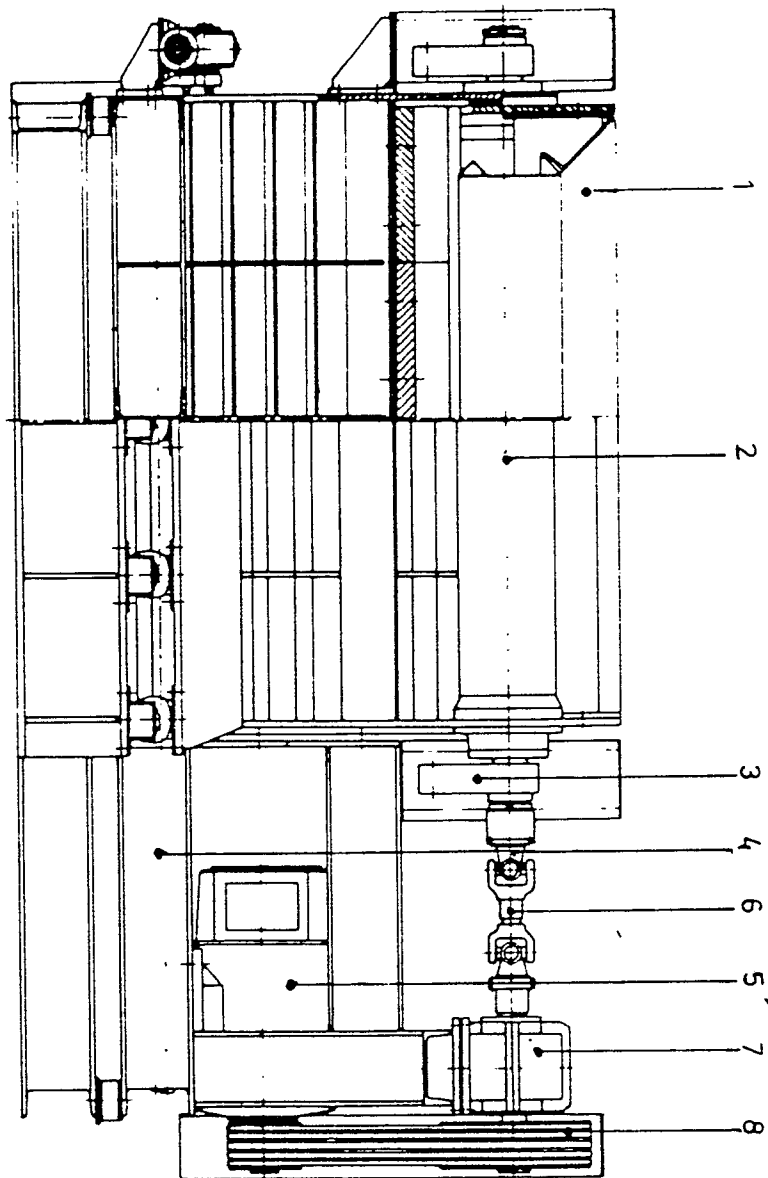


FIG. 2.



UNIVERZAL VIBRATING CRUSHER

1. HOPPER
2. DRIVING SHAFT
3. EXCENTRIC WEIGHT
4. ELECTRIC MOTOR SUPPORT
5. ELECTRIC MOTOR
6. CARDAN JOINT SHAFT
7. SPEED REDUCER
8. V - BELTS
9. SUPPORT FRAME
10. PRESSURE FLAP DRIVE
11. VIBRATION MOUNT
12. FIXED FRAME
13. IMPACT PLATE
14. VIBRATION FRAME
15. PRESSURE FLAP
16. VIBRATION DAMPER
17. SUPPORT FRAME OF  
LOWER IMPACT PLATES
18. SUPPORT FRAME OF  
UPPER IMPACT PLATES