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D-81633 München (DE)(54) **DEVICE FOR SEPARATING SUPPLYING RAW MATERIAL TO BE CRUSHED FOR USE IN A
CENTRIFUGAL CRUSHING MACHINE**

(57) A device for separating and supplying raw material to be crushed for use in a centrifugal crushing machine wherein rod-like or belt-like constituent members are disposed in a radial fashion so as to

make an integral structure which can rotate in a horizontal direction, every other or every several constituent members being placed lower than the other members.

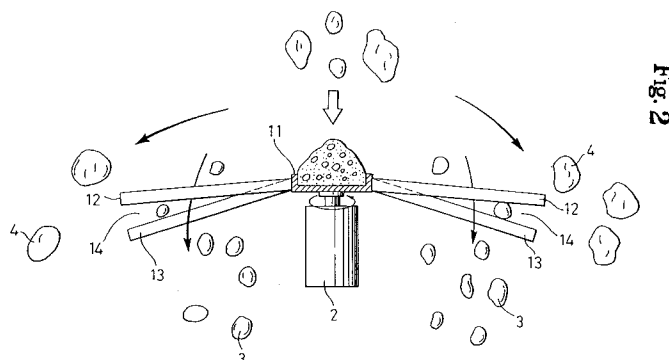


Fig. 2

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Field of the invention

This invention relates to a raw material feed sorting device for a centrifugal crusher comprising a crushing chamber molded inside the housing of the crusher, an impact material set around the periphery of the crushing chamber, a rotor positioned in the center of the crushing chamber that rotates in a horizontal plane and expels raw material from its peripheral ports to the impact material, a first feed channel that supplies raw material into the rotor, and a second feed channel that supplies raw material into the space between the periphery of the rotor and the impact material, wherein the feed sorting device separates and selectively supplies raw material to the first feed channel and the second feed channel.

Prior art

Fig. 3 illustrates a conventional centrifugal crusher a used to crush mineral ores and similar materials, as disclosed in Japanese utility model No. S63(1988)-59329. In that crusher, raw material b to be crushed (hereinafter referred to as raw material) is sorted by a rotatable feed sorting device c shaped like an umbrella frame. In that crusher, pieces of raw material of comparatively small diameter are fed into the rotor d, while pieces of raw material of comparatively large diameter are fed into the space between the outer periphery of the rotor d and a dead bed, steel anvil, or other impact material e. Thereafter, the smaller pieces of raw material, being expelled from inside the rotor d rotating at high speed, collide with the larger pieces being fed between the outer periphery of the rotor d and the impact material e, then further impact with the impact material e, effectively crushing the raw material.

The conventional feed sorting device c comprises a top plate f, used for forming the dead bed to absorb the impact of the falling raw material, and a cluster of rod-shaped or other type of structural members g, protruding radially at a prescribed spacing, from the side face of the top plate f. The ends of the cluster of structural members g slope downwardly at a fixed angle. Therefore, all members of the cluster g are arranged in virtually the same flat plane. Accordingly, when the feed sorting device c is rotated, and raw material is introduced, those pieces of raw material of comparatively small diameter that should pass through the channels h collide with the rotating structural members g and are projected outwardly into the space between the rotor d and the impact material e. In this case, a required feed volume within the rotor d cannot be obtained, and the crushing efficiency is decreased.

The object of this invention is to resolve these problems. Hence, the invention provides a feed sorting device for use in a centrifugal crusher, which accurately sorts the raw material according to the diameter of the pieces, and suitably adjusts the feed volume into and outside of the rotor, thereby improving the crushing efficiency.

Disclosure of the invention

The device according to the invention comprises upper structural members and lower structural members, wherein the void between two adjacent structural members through which the raw material passes is not in a flat plane like that of a conventional device, but instead forms a groove-like channel of a specify depth. Hence, raw material falling from above the rotating upper and lower structural members can be captured by such grooves, and while sliding towards the ends of the structural members, can accurately be sorted and fed into the appropriate section of the crushing chamber. The volume of raw material being fed inside and outside of the rotor is therefore maximized for better crushing efficiency.

Moreover, raw material can be fed at a prescribed feed volume to readily adjust the respective volumes being supplied inside and outside of the rotor, and the raw material can readily and accurately be sorted by size.

Brief explanation of the drawings

- Fig. 1 is a perspective diagram of the raw material feed sorting device of the present invention.
- Fig. 2 is a cross section diagram of the raw material feed sorting device of the present invention.
- Fig. 3 is an explanatory diagram of the overall configuration of a conventional crusher.
- Fig. 4 is an explanatory diagram of a conventional raw material feed sorting device.

Detailed description of preferred embodiments

An example of the present invention is explained below, with reference to the accompanying drawings.

Fig. 1 and Fig. 2 illustrate a feed sorting device 1 according to this invention which comprises a top plate 11 and upper and lower structural members 12, 13.

The top plate 11 is a circular or other type of plate formed from a steel member or another rigid member. A short wall is erected around the periph-

eral edge of the plate to form a dish. The purpose of the top plate 11 is to fill the dish with raw material falling from above to form a dead bed which will absorb the impact of the falling material. The upper structural members 12 are formed from steel or other rigid rods or bands which are attached radially at a prescribed spacing to the central top plate. One end of each rod is welded or otherwise connected to the outer peripheral surface of the top plate 11, while the other end is tilted slightly downwardly.

The lower structural members 13 are formed from the same materials as the upper structural members 12, with each member being attached radially to the central top plate at a prescribed spacing between each component of the upper structural members 12. However, the lower structural members 13 are tilted at a greater angle such that their ends are positioned below the ends of the upper structural members 12. For example, the upper structural members are sloping at 10°, while the lower structural members are sloping at 20°.

The feed sorting device 1, having a configuration of this kind, is rotatable in a horizontal plane by a suitable drive device. For example, a motor 2 which will support and rotate the top plate 11, as shown in Fig. 2, or any other publicly-disclosed device can be used.

The diameter of pieces of raw material for sorting and passage through the channels can arbitrarily be selected by adjusting the pitch between the lower and upper structural members 12 and 13. Also, as shown in Fig. 1, the components of the lower and upper structural members 12 and 13 are alternated one by one. However, a plurality of components of either the upper or lower members can be alternated. Moreover, in the configurations of Fig. 1 and Fig. 2, the components slope downwardly, but the components can also lie flat or slope upwardly.

Since the lower structural members 12 are positioned below the upper structural members 13, the void between two adjacent structural members for the falling raw material is not flat like that of a conventional device, but rather forms groove-like channels 14 of a specified depth. Thus, as shown in Fig. 2, raw material falling from above the rotating structural members 12 and 13 can be captured by the grooves or gaps. Hence, while sliding towards the ends, raw material 3 having a comparatively small diameter falls from the grooves and into the rotor. On the other hand, raw material 4 having a comparatively large diameter slides towards the ends of the upper and lower structural members 12 and 13, where the pieces are discharged and fed into the space between the rotor and the dead bed or other impact material.

Industrial field of application

As described above, the invention applies to a raw material feed sorting device for a centrifugal crusher used to crush mineral ores or other raw material.

Claims

1. A raw material feed sorting device for a centrifugal crusher, comprising
 - a crushing chamber molded inside the housing of the crusher,
 - an impact material set around the periphery of the crushing chamber,
 - a rotor positioned in the center of the crushing chamber that rotates in a horizontal plane and expels raw material from its peripheral ports to the impact material,
 - a first feed channel that supplies raw material into the rotor, and
 - a second feed channel that supplies raw material between the periphery of the rotor and the impact material;
 wherein the feed sorting device separates and selectively supplies raw material by size to the first feed channel and the second feed channel, and for this purpose, a cluster of band-shaped or rod-shaped structural members are arranged radially to form an integral unit that can rotate in the horizontal plane, and wherein a portion of the structural members is positioned below and alternatedly with every other or alternatedly with a prescribed plurality of the other structural members.
2. The raw material feed sorting device for a centrifugal crusher as claimed in claim 1, in which a dish-shaped top plate is molded in the center of the cluster of the structural members.

Fig. 1

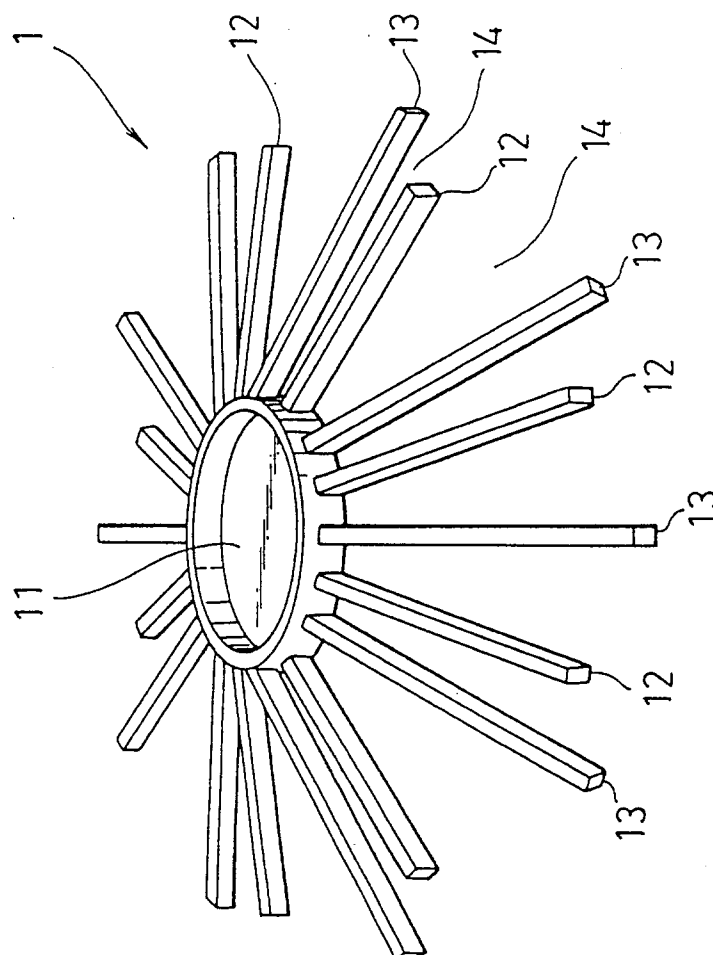


Fig. 2

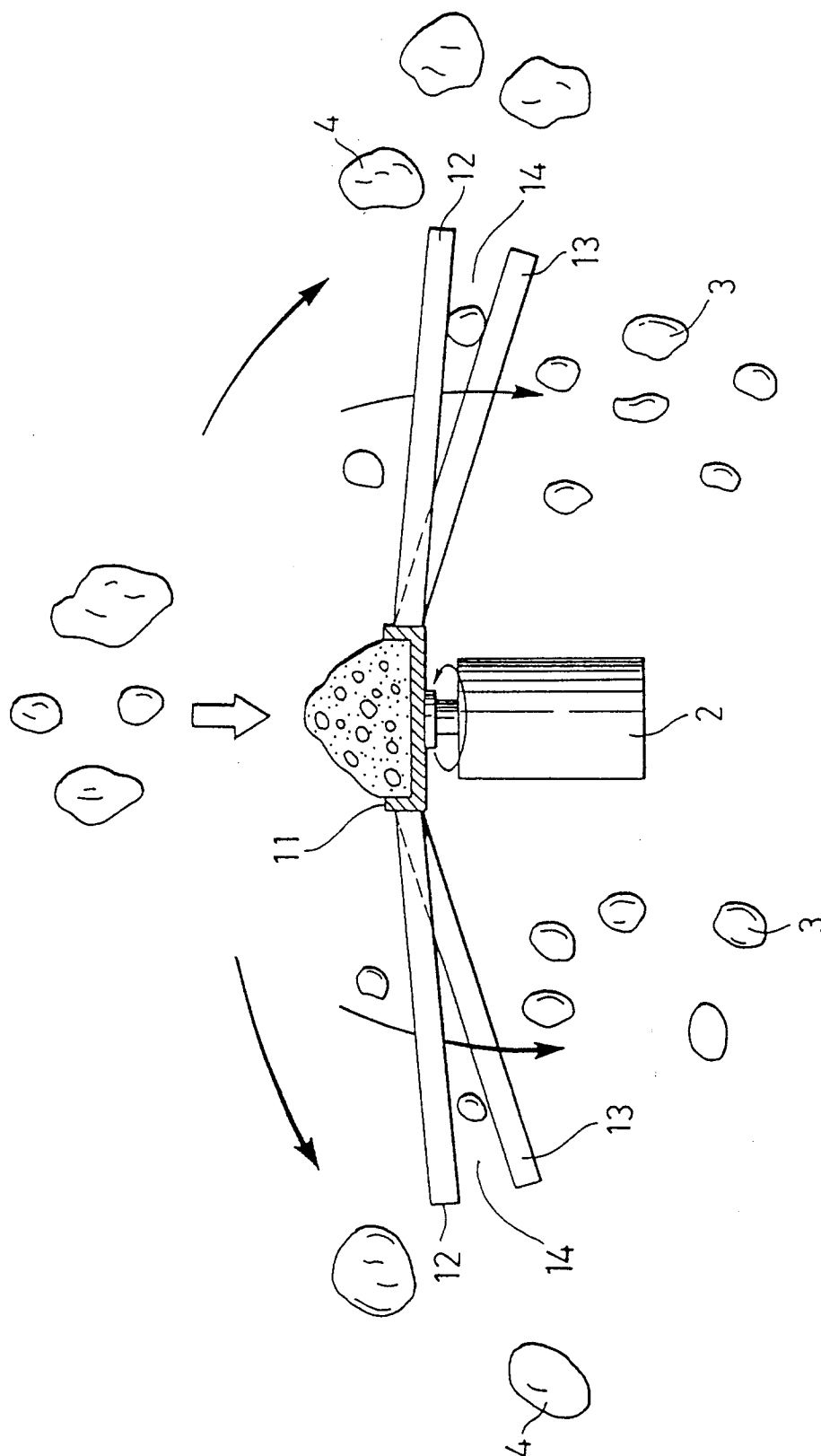


Fig. 3

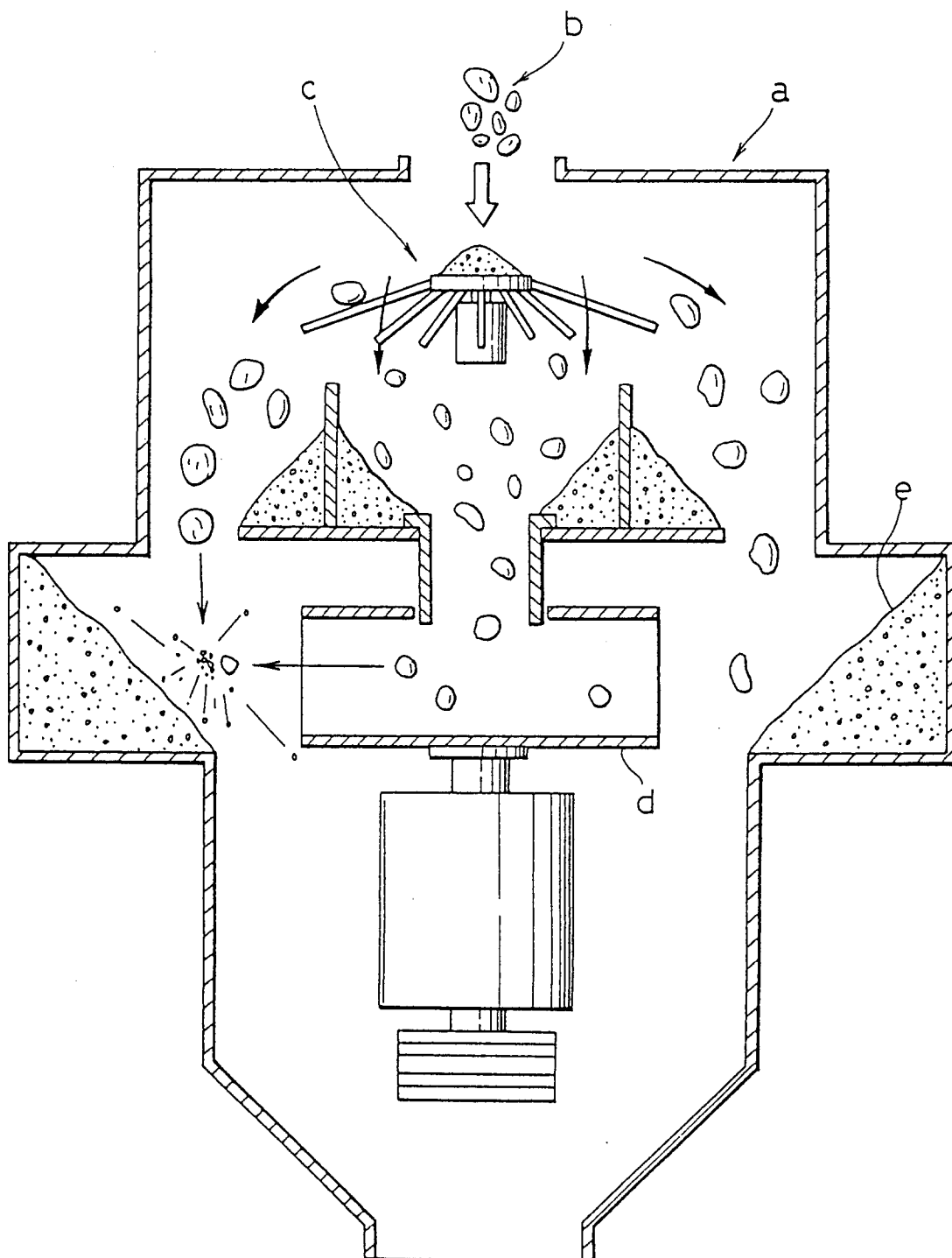
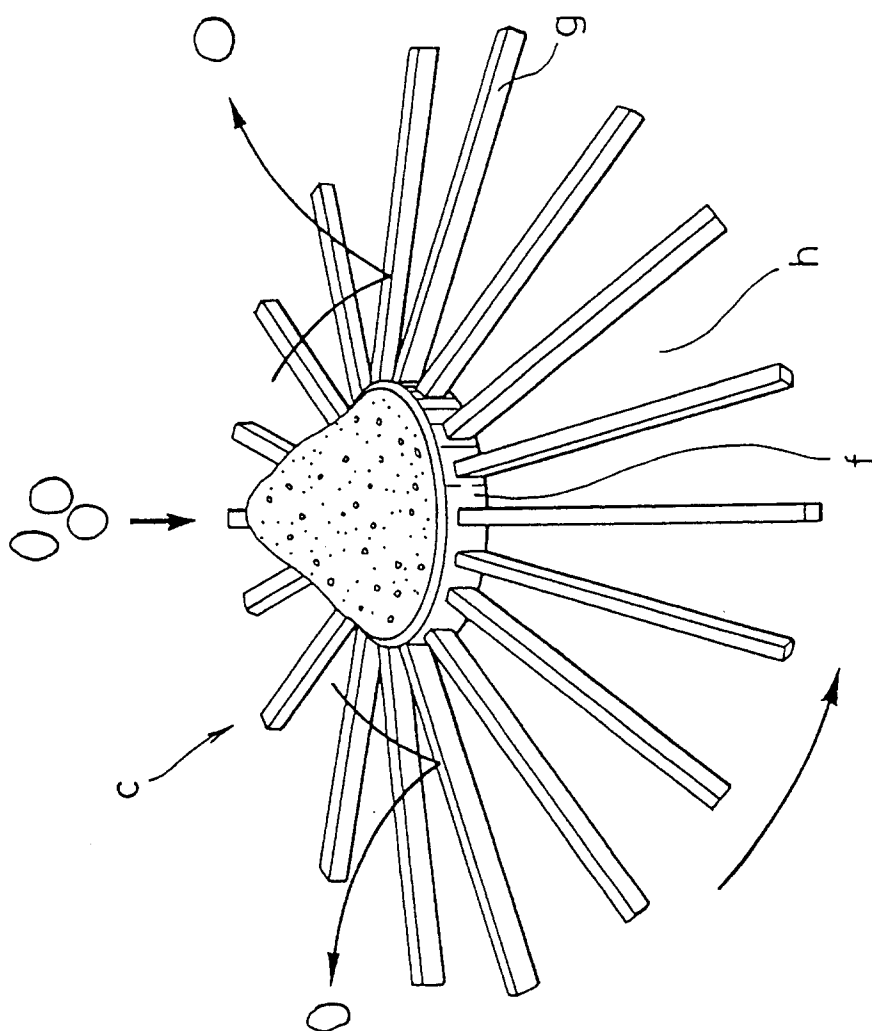


Fig. 4



INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP94/02012

A. CLASSIFICATION OF SUBJECT MATTER

Int. Cl⁶ B02C13/14, 13/286

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

Int. Cl⁶ B02C13/00-31, B07B1/00-62, 13/00-18

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Jitsuyo Shinan Koho 1926 - 1995

Kokai Jitsuyo Shinan Koho 1971 - 1995

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	JP, Y2, 5-10923 (Kotobuki Giken Kogyo K. K.), March 17, 1993 (17. 03. 93), Claim, line 16, right column, page 2 to line 39, left column, page 3, line 29, right column, page 4 to line 13, left column, page 5, Figs. 1 to 3, 5, (Family: none)	1, 2
Y	JP, Y2, 5-10924 (Kotobuki Giken Kogyo K. K.), March 17, 1993 (17. 03. 03), Claim, line 12, left column to line 13, right column, page 3, Fig. 2, (Family: none)	1, 2
Y	JP, B2, 63-66274 (Kyokuto Kaihatsu Kogyo K. K.) December 20, 1988 (20. 12. 88), Claim, Figs. 1 to 3, (Family: none)	1
Y	JP, Y2, 63-49336 (Kyokuto Kaihatsu Kogyo K. K.) December 19, 1988 (19. 12. 88), Claim, Figs. 1 to 3, (Family: none)	1
EX	JP, A, 6-339638 (Kotobuki Giken Kogyo K. K.),	1, 2

☒ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

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Date of the actual completion of the international search
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