

## BRIEF DESCRIPTION OF THE DRAWINGS

[0015] The invention is shown with reference to exemplary embodiments in the drawing and is explained below. In the drawing:

[0016] **FIG. 1** shows the plan view of a device according to the invention, designed as a spray head and having a cylindrical basic form, on the side provided with spray nozzles,

[0017] **FIG. 2** shows the side view of the spray head in **FIG. 1** in the direction of section line II, partly cut away,

[0018] **FIG. 3** shows the view of the spray head in **FIG. 1** in the direction of arrow III, which shows the connection side,

[0019] **FIG. 4** shows an enlarged illustration of **FIG. 2**,

[0020] **FIG. 5** shows a greatly enlarged partial view of the cover ring of the spray head in **FIG. 1** from the inside of the spray head, but without the screwed-in spray nozzles,

[0021] **FIG. 6** shows the perspective illustration of one of the swirl inserts to be screwed in,

[0022] **FIG. 7** shows the view of the spray head in **FIG. 1**, which spray head, however, is suitable for spraying coolant and lubricant to both sides,

[0023] **FIG. 8** shows the side view, cut away along section line VIII, of the spray head in **FIG. 7**, and

[0024] **FIG. 9** shows—in a similar manner to **FIG. 3**—the view of the spray head in **FIGS. 7 and 8** in the direction of its connection point.

## DETAILED DESCRIPTION OF THE INVENTION

[0025] **FIGS. 1 to 4** show a cylindrical housing **1** in the form of a shell which is open on one side and is provided on one side with a flat **2** which runs parallel to the central axis **3** of the housing **1**. In this case, the central chamber **4** of the housing **1** is closed off on the open side by a cover which consists of a cover ring **5** having a lateral flat aligned with the flat **2** and of a cover disk **6** which is screwed into a thread **7** of the cover ring **5** and is provided with lateral parallel application surfaces **8** for a tool for the assembly operation. The countersunk screws **9** hold the cover ring **5** on the housing **1**.

[0026] As **FIG. 3** shows, the flat **2** in the region of the housing **1** is provided with connections for the media to be sprayed; for example, a connection **10** for cooling liquid, a connection **11** for a liquid lubricant and a connection **12** for compressed air are provided. A flange **13** can then be put onto the flat **2**, as indicated by broken lines in **FIGS. 1 and 2**, this flange **13** being part of a connection piece **14** in which the feed lines for the cooling liquid, for the lubricant and for the compressed air run parallel to one another and which may also serve as a guide arm for the spray head according to the invention.

[0027] Six spray nozzles **17** for lubricant are provided in the cover ring **5** so as to be uniformly distributed over a diameter, this lubricant being fed via the connection **11** and then leading into an annular passage **15**, which is at first designed as an encircling groove on the open side of the housing **1** and is then closed by the mounted cover ring **5** and

by inserted sealing rings **16**, for example commercially available O-rings. The spray nozzles **17** in this case may be designed as “minimum spray nozzles”, which are known per se. Compressed air is fed to these spray nozzles **17** via a further annular passage **18**, which is produced as a groove in the same way as the annular passage **15** and is then closed by putting on the cover ring **5** and the sealing rings **16**. This inner annular passage **18** is connected via a respective branch bore **19** to the space for the screw-in thread of the respective nozzle **17**, so that the spray nozzles **17**, apart from being supplied with lubricant, can also be supplied with compressed air for the fine spraying of the lubricant. In this way, the spray nozzles **17** can be specifically designed for the compressed-air atomization of the lubricant. The lubricant consumption can be kept low as a result.

[0028] **FIG. 5** shows the cover ring **5** in a cutaway and greatly enlarged view. Screw-in threads **50** for the lubricant nozzles **17** and the branch bore **19** opening into the space for the screw-in thread **50** and intended for feeding compressed air can readily be seen. Tapped holes **52** which are provided for the fastening of the cover ring **5** to the housing **1** can also be seen.

[0029] In a manner not shown in any more detail, the circular-cylindrical chamber **4** of the housing **1** is connected via an opening **30** provided in its wall to the connection **10** for the cooling liquid, which in this way is directed into the chamber **4** and can be sprayed outward from there via nozzle openings **20**. The cooling liquid is introduced tangentially or at least eccentrically through the opening **30**, so that stable flow conditions are present in the chamber **4**. The cover disk **6** thus forms a cluster nozzle unit having seven nozzle bores **20** in the exemplary embodiment, swirl inserts **21** with which a conical jet is to be produced at the outlet of the nozzle bores **20** being arranged in each case upstream of said nozzle bores **20**, as can be seen in particular from **FIG. 4**. In this case, the swirl inserts **21**, as **FIG. 4** shows, are screwed into a corresponding thread **23** from that side of the locating holes **22** for the swirl inserts **21** which faces the chamber **4**, rounded-off corners **24** of each swirl insert **21**, which are provided with threaded parts, engaging in this thread **23**. For the application of a tool, the swirl inserts **21** have an application groove **25**. Flattened side faces **21a**, which then merge into swirl passages **26**, enable the coolant to pass through. The cover disk **6** has a thread on its circumference and is screwed into a matching thread on the cover ring **5**. The cover disk **6** is sealed off from the cover ring **5** via a flat gasket ring **27**. The spray head in **FIGS. 1 to 4** is designed for spraying coolant and lubricant to one side. It can be adapted in its dimensions to the die to be sprayed or to a tool for metal forming. Its external form and also the arrangement of the spray nozzles **17** and of the spray openings **20** may therefore deviate from the circular shape.

[0030] It may also be mentioned that the mutual rotation of housing **1** or housing ring **1a** is locked by a straight pin **28** which runs parallel to the axis **3**, reaches through the cover ring **5** and in each case is directed right into the housing **1** or the housing **1a**.

[0031] **FIGS. 7 to 9** now show a spray head which corresponds in construction to that in **FIGS. 1 to 4** but which is designed for spraying a mold on both sides. The same parts are therefore provided with the same reference numerals. A difference here is that the housing **1'** is not designed