

Keyway making fixture⁵²

CONSOLATION

Vijay Ghodke (58), is a motor rewinding electrician, from Vaijapur, Aurangabad in Maharashtra. He completed his pre-degree from the Nank Road College of Science affiliated to the University of Pune. He runs a workshop and electric winding shop at Vaijapur and has accumulated about 37 years experience in the machinery line (oil engine repairing 12 years and lathe machinery- 25 years). His family consists of seven members. He earns about Rs.6000-7000 per month. But currently he is facing financial difficulties as due to lack of rains in the area, the water level has gone down and hence motors are not being used.

Genesis While working in the workshop with the lathe machine, Vijay found it a problem that he could only do specific and limited jobs on the machine. When any customer came with a small job work with a small diameter, he was unable to utilize the lathe machine completely. In addition there was no other way of doing it but manually which was very time consuming. Then he conceived the idea of a keyway making fixture for lathe machines. He thought about the idea for a long time and once he clarified it in his mind he took one day to make it. Now he can take a big size job or small size job and do it directly on the lathe machine with the help of this fixture.

The Innovation

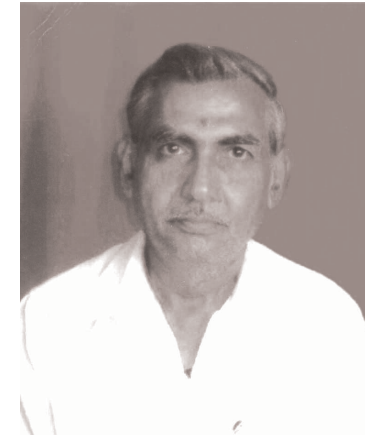
This fixture is mounted on the carriage instead of the tool-post. It has a horizontal v-notch along the plane of the lathe and another plane strip of metal to support the job from the other side. This can be used to hold jobs with a wide range of diameter. The job is inserted inside the eye of the eyebolt and is fixed to the fixture. This is supported by the v-

groove on the main body of the fixture, which is centered with the lathe in use.

The set-up time is five to ten minutes. The device also helps to hold the taper shaft without any damage. This fixture can handle a wide range of work diameters. The key can be made at high speeds with close tolerances. It has a self centering mechanism for maintaining center line. In addition there are no clamping marks on the job. The fixture also allows pipe fitments and cutting of fine teeth on the surface which is not possible in conventional work holding and key-way cutting techniques. The device costs Rs.500.

Advantages

This is a fast, precise and reliable keyway making instrument. In the conventional lathe without using a fixture the set up time for the job is 45-60 minutes whereas using the fixture of Vijay, this time is reduced to five to ten minutes. The cost of making a keyway is also reduced from Rs.70-100 (for 2-3 inch diameter and length) to Rs. 30. The conventional lathe has wide tolerance

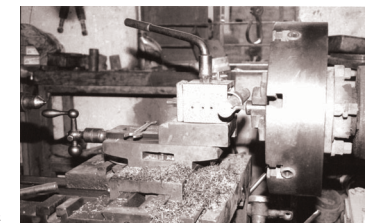


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level and so accuracy cannot be maintained up to the desired level but with this fixture close tolerance and accuracy level can be maintained as in a milling machine. While there are other types of keyway making fixtures available in the market, they have low surface contact increasing the possibility of slippage and there is a strong possibility that a hollow pipe with thin walls could develop a dent. But Vijay's fixture enables maximum surface contact to hold the job. Thus, even a job having a thin wall can be handled with ease.

Relevance of the innovation

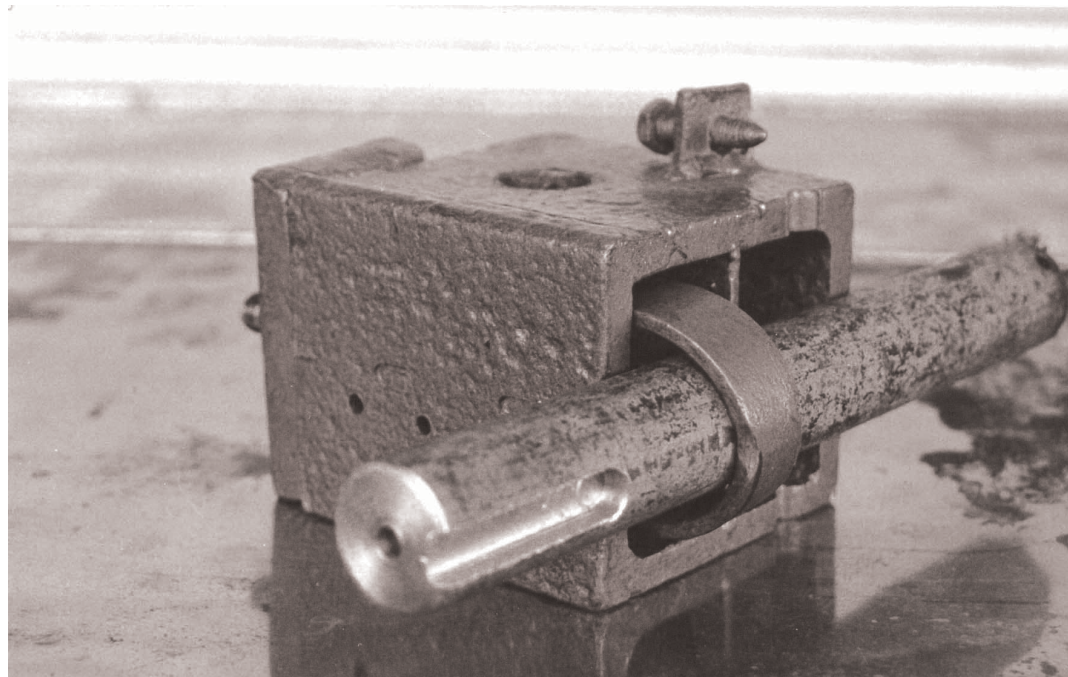
Keyway making is a part of the everyday work of fabricators. Specialized machines for making keyway are Milling, Slotting and Shaping machines. But small-scale workshops cannot afford those machines. Hence small workshops having lathe machines usually do not cater to jobs that need milling operation. They tend to refer the customer to a workshop that carries a milling

machine. In addition set-up time and cost of making keyway increases if keyway is made using tool post and chuck bar of the conventional lathe.

But using Vijay's innovative fixture the setup time can be reduced and hence processing cost can be reduced significantly. Small-scale workshops that cannot afford the specialized machines (Milling, Slotting and Shaping) can also undertake jobs, which require making keyways.

Mechanically inclined

Vijay Ghodke takes after his father, Shantaram Ghodke, in his innovative spirit. His father was working in the railway workshop at Manmad Sub-division as a mechanical supervisor when he had developed a unique double wagon locking system for goods trains for the Railways in 1953-54. It was accepted by the Railways and he was rewarded with Rs.300 and a promotion. In 1961 his father took voluntary



retirement and started an engineering workshop at Deola Nashik. Vijay could not study further after his twelfth standard and then he started working in their workshop repairing oil engines, water pumps and also working on lathe machines.

Later electric motors came into use and he started rewinding and repairing motors. While involved in this he noticed that it was difficult to wind on empty reels and he started thinking of some solution so that the work could be done easily. He succeeded in making a device which would roll the wire without breaking and which could be operated by a ¼ HP single phase 1440 RPM, 220 volts electric motor or in case of a power failure, could be wound by hand. This device is easy to operate and with this 50 kg of wire can be rolled in a day. He has sold about 50 pieces of this wire rolling machine.

Future plans

Vijay has developed only one unit of the key way making fixture for his personal lathe. He has not informed anyone else about the product or sold it in the market because of the fear of copying. According to him the best strategy for the commercialization of this product would be to license it to a large lathe manufacturer. NIF has sanctioned Vijay Rs.15, 000 from the Micro Venture Innovation Fund for prototype development and demand estimation. NIF has also filed a patent application on his behalf.

Vijay also has an idea of doing some innovation in water pumps for increasing their efficiency. He is thinking of developing a fixture for making internal keyways for example for pulleys. Regarding his future plans, he is thinking of starting a dealership of motors or pumps as manufacturing which he is currently involved in requires greater fixed costs and he feels that he should focus on selling these.