Applying NX software to calculate the rotation angle of the Huron head on universal milling machine

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ABSTRACT: Huron milling machine head is a popular and effective machine head structure. However, the calculation of rotation angle control sometimes causes many difficulties for the operator. This article will solve that problem thoroughly through a popular 3D software. The operation is simple for ordinary operators. **Keywords:** Huron, huron head, milling machine, software, 3D, design.

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I. INTRODUCTION

A long-established and successful French Company - their first lathes and milling machines being manufactured cira 1873 - Huron was first named after its founder Pierre Philippe Huré, as Etablissemets P.Huré and then, from 1967, as Huré S.A.

Early Huron products included both conventional and unusual designs of vertical and horizontal milling machines, backgeared and screwcutting lathes, horizontal borers and gear-cutting machines. However, the first sight of what was to become the Huron trade mark, the revolutionary double-swivel milling head, was not until an industrial exhibition - les Grandes Usines - held in 1894. However, apart from the head, the rest of the miller was entirely conventional, being based on an established and quite ordinary horizontal type with flatbelt drive and backgear. In 1913 Pierre's son, Léon, became involved in the business and, by 1921, had developed his father's early double-swivel head machine into the far more versatile and now very familiar ramhead form. The first models of this type were constructed not by Huron themselves but, inexplicably, by the well-known Swiss company Oerlikon, in Zurich, during 1924 - perhaps internal politicking in the factory had caused some sort of rift between the generations and it was the son's only way of getting his design manufactured. [1]



Fig. 1 Huron head structure

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By the 1940s through to the 1950s a wide variety of the Type "K" was being offered, all incorporating the swivelling head and including general purpose, specialised and copying versions; the Model Types included the "K", "KU", "KVC", KVCAO", "KVP", "KH", "KVR", "KUR", "KHR", "LR", 2-LUR", and "L". By the 1960s a modified range of machines was in production, these being given the prefix "M" and "N" with identified versions being the: "N", "M", "NU", "MU", "MVC", "MVCAO", "MVP", "MVPCNP", "MVPCNC", "MVGVCNP", "MVGVCNC", "MH", "MVR", "MUR", "MUCNP", "MUCNC", "MHCNP", "MHCNC", "MHCNC", "MHR", "LR", "2-LUR", "L", "2-LUR", "L", "P", "PU", "PUCNP", "PUCNC", "R" and "RU".



Fig. 2Huron head

Capable of being adapted to an unusually wide range of machining operations the Huron type is still popular today, though the very mass of the machines mitigates against their use in smaller workshops.

1. Set coordinate system

II. DESIGN ON 3D SOFTWARE



Fig. 3Coordinate system

2. Simulation of Huron head structure on NX software



Fig. 4Huron head structure on NX software

Huron head is simulated through 3 parts: 1, 2 and 3. The coordinate system is attached to the structure as shown in the drawing.

3. Implement constraints between parts

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Fig. 5Constraints between parts Make constraints between the parts as shown in the drawing.

4. Set the angle constraint between the tool axis and the Oy direction



Fig. 6Set the angle constraint between the tool axis and the Oy direction

5. Simulation of adjusting the rotation angle when adjusting the milling head tilt angle

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Fig. 7Adjusting the rotation angle



6. Measure the rotation angle at flange A

Fig. 7Rotation angle at flange A





Fig. 8Rotation angle at flange A

8. Rotate the Huron machine head Rotate the Huron machine head at 2 rotation angles on the 2 flanges A and B just measured on the software.

III. CONCLUSION

The structure of the Huron milling machine head is a classic structure but effective and easy to use. However, the adjustment operation is difficult due to the lack of a method for calculating the angle of rotation adjustment. This paper has proposed a method for calculating the angle of rotation adjustment by applying modeling on a 3D design software. The method has achieved success and is widely applied in production. The results of the paper bring high efficiency in academia and practice.

There has never been a paper that has studied this problem, so the author's paper is the first to present an effective and easy method for calculating the angle adjustment of the huron head.

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REFRENCES

[1]. https://www.lathes.co.uk/huronmillers/index.html(accessed on April 19, 2025).