IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

WU et al.	§	
	§	Interference No. 102,447
	§	
v.	§	
	§	Examiner-in-Chief:
CHU	§	Ronald H. Smith

DECLARATION OF C. W. CHU

Box Interference
Commissioner of Patents
and Trademarks
Washington, D.C. 20231

ROUGH

Attention: Ronald H. Smith
Examiner in Chief

Dear Sir:

I have read statements contained in Declaration by Maw-Kuen Wu dated November 6, 1990 and filed in the above identified interference.

1. From 1982 to 1984 M.K. Wu worked as a post doctorate ~~student~~ fellow under by direction ~~and control.~~ (since under my supervision)

2. Upon receiving his Ph.D. in 1982, M.K. Wu assumed an ~~associate~~ assistant professorship at University of Alabama.

3. During November - December 1986, researchers operating under ~~by~~ my supervision ~~and control~~ reproduced and confirmed as being a superconducting composition one composed of La-Ba-Cu-O as had been reported by Bednorz and Muller, (published in Sept. 1986) ~~Jan. 1987~~, as possibly superconductive.

4. During December, 1986, researchers at my direction and ~~control~~ examined the effect of application of great pressure to compositions of La-Ba-Cu-O with regards to the temperature at which

such compositions became superconductive and the application of such pressures was found to unexpectedly enhance the T_c temperature of such La-Ba-Cu-O compositions. at an unusually high rate

5. Based upon this pressure effect, I conceived of the idea that the enhancing pressure effect could be chemically reproduced by substituting for the La (or Ba) atom of a La-Ba-Cu-O composition the smaller atomic radii rare earth element of yttrium (or Sr). I disclosed this concept to ~~Pei Hor and~~ Ru-Ling Meng who ~~were~~ was then a research associate working under my ~~control and~~ direction. These discussions ~~with Pei Hor and~~ Ru-Ling Meng focused specifically on the substitution of Y for La within a formula range for such substituted composition of $(Y_{1-x}Ba)_aCu_1O_y$ wherein "x" = 0.075 to 0.5 and "a" is 1 to 2 with "y" being variable within a range of 2 to 4. These discussions with Ru-Ling Meng ~~and Pei Hor~~ occurred during about mid-December 1986 and I requested Ru-Ling Meng to begin making compositions of Y-Ba-Cu-O for evaluation.

6. From December 27, 1986 until about January 4, 1987, M.K. Wu and James Ashburn were present at my laboratories for purposes of testing of samples of La-Sr-Cu-O which they had made pursuant to my request earlier my conception that Sr substitution for Ba in a superconductive composition of La-Ba-Cu-O would chemically reproduce ~~produce~~ the enhancing effect on T_c which pressure produced when applied to an La-Ba-Cu-O. Testing of the La-Sr-Cu-O Composition prepared by Wu confirmed that T_c was enhanced, although the quality of Wu made samples was to poor to support a publication.

7. On January 12, 1987, a U.S. Patent Application Serial No. _____ in which I am named as the inventor was filed which describes the enhancement of the T_c of an La-Ba-Cu-O composition by

For this reason Ru-Ling Meng whom I had previously requested to prepare samples of Y-Ba-Cu-O for evaluation was assigned to make better

(1) (2) (3) (4)

IS THIS LAWYER?

WHOSE WRITING? — ADDED SENT.

application of high pressures and further that such pressure enhancement may be achieved chemically by substituting of either the La or Ba atoms thereof by other specifically identified atoms. Among this discussion of these two means for enhancing the T_c in the application as filed are the following two paragraphs from page 6 there of:

> "Reducing the interatomic distances between the atoms of the elements in a lanthanum, barium, copper oxide composition can increase the superconducting transition temperature T_c of the composition.
>
> "Another method for decreasing the interatomic distance is to completely or partially substitute the barium atoms, atomic radius of 2.22 angstroms, with the smaller alkaline earth metal atoms, i.e., strontium, atomic radius of 2.15 angstroms, calcium, atomic radius of 1.97 angstroms, or magnesium, atomic radius of 1.6 angstroms. Similarly, complete or partial substitution of the lanthanum atoms, atomic radius of 1.87 angstroms, with the smaller lutetium, atomic radius 1.75 angstroms, with the smaller lutetium, atomic radius 1.75 angstroms, or yttrium, atomic radius 1.78 angstroms, will provide 'this same effect'. Consequently, any means for reducing this interatomic distance should enhance the T_c of the composition. One means for reducing this distance is to apply a pressure that exceeds atmospheric pressure. The T_c increases as the applied pressure is increased."

8. On January 29, 1987 I received a call from M.K. Wu which related that in a composition consisting of Y-Ba-Cu-O zero electrical resistance had been observed at a temperature of 77°K or greater and that Wu would bring samples of same to my lab for testing for Meissner effect to confirm if they were superconducting.

9. On January 30, 1987, M.K. Wu and James Ashburn arrived at my lab; four pieces of sample which they brought were tested for resistance ~~at X~~ and Meissner effect at varying temperatures. The best specimen tested

for zero resistance at a temperature of about 77.8°K and it exhibited about ____% of the superconducting signal of a Pb sample of comparable dimension.

10. On or ~~after~~ January 30, 1987 ~~and before February 1, 1987~~ while M.K. Wu was in my office, he advised me that personnel at University of Alabama were pressing him to file an application for patent on the composition of his Y-Ba-Cu-O sample. At that time, I made available to Wu for his review a copy of my U.S. Patent Application Serial No. 006,991 (filed January 26, 1987) wherein he reviewed the disclosure and related that the composition of his samples were within the genus of Y-Ba-Cu-O compositions disclosed in my application.

11. On or about January 31, 1987, I prepared a manuscript of an article for submission to Physical Review Letters which named as co-authors, among others, M.K. Wu and James R. Ashburn who both reviewed and approved the manuscript and thereafter on February 1, 1987 departed to return to Alabama.

12. After the departure of Wu and Ashburn, this manuscript was subsequently revised to incorporate further data concerning the composition and properties of the Y-Ba-Cu-O material therein described. The material described in this manuscript is one prepared at my lab by R.L. Meng under my ~~control and~~ supervision to a nominal formula of $Y_{1.2}Ba_{0.8}Cu_1O_y$. This material was observed to be comprised of a mixture of compositions, green and black phases, neither of which was of a crystalline structure like that of K_2NiF_4 which is the crystalline structure type of a superconductive La-Ba-

Cu-O composition. Further, this Y-Ba-Cu-O material was observed to exhibit at 4°K a superconducting signal which was about 24% of that of a Pb sample of similar dimensions. A copy of the so revised manuscript was forwarded to M.K. Wu at or about the time of February 5, 1987 when it was forwarded by Federal Express delivery to Physical Review Letters wherein, after manuscript corrections called in on February 18, 1987, the article was published in the March 2, 1987 edition at Vol. __, pp. ___ of the Physical Review Letters.

13. It is my understanding that after my mid December 1986 discussion ~~I discussed~~ with Pei ~~Hor and~~ Ru-Ling Meng of my concept of substituting Y for La in a La-Ba-Cu-O composition to produce one consisting essentially of Y-Ba-Cu-O which would exhibit enhanced T_c that Pei Hor and Ru-Ling Meng in a subsequent meeting with M.K. Wu while Wu was at Houston from December 27, 1986 to about January 4, 1987 described to M.K. Wu my concept for Y substitution. ~~I further understand that it was understood by Pei Hor and Ru-Ling Meng that M.K. Wu would undertake to make samples of Y-Ba-Cu-O compositions for evaluation~~ while Ru-Ling Meng turned her attention from the production of Y-Ba-Cu-O Composite as I had previously instructed instead to be. production of higher quality Samples of La-Sr-Ba-O.

14. I further am aware that R.L. Meng who otherwise during the period of January 1987 would have made samples of substituted species, including those of Y-Ba-Cu-O, in accordance with my directions, diverted her efforts to production of La-Sr-Cu-O materials of higher quality than those which Wu had made. ~~and that it was understood~~ that Wu would commence ~~production of Y-Ba-Cu-O material during this interim period.~~

15. In the Declaration by M.K. Wu, I noted the following statement:

> " At no time prior to January 29, 1987, had I ever discussed with Chu the possibility of the preparation of, or the potential superconducting properties of, the oxide composition described in paragraphs 2 and 3 above." [i.e., $Y_{1.2}Ba_{0.8}Cu_yO_z$]

While such statement is correct insofar as it goes considering the qualifications therein, it is misleading if read to mean that my conception of a composition consisting essentially of Y, Ba, Cu and O as one of enhanced T_c was at no time prior to January 29, 1987 discussed in the presence of or communicated to M.K. Wu. I understand that my concept was discussed with and communicated to M.K. Wu by Pei Hor and Ru-Ling Meng ~~in late December 1986 or early, i.e., before January 4, 1987~~ sometime between December 27, 1986 and Jan 4, 1987 while M.K. Wu was present in my laboratories at the University of Houston.

16. I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the Chu Application or any patent issued thereon.

EXECUTED this ____ day of _____, 1990.

_____
CHING-WU CHU